CAPELLA TECHNOLOGIES

Multi-Host Printing

User's Guide

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Preface

This user's guide provides detailed explanations and procedures for installing, configuring and utilizing Multi-Host Printing (MHP) from Capella Technologies.

User Manual Overview

This user manual is organized into the following sections:

Chapter 1: Introduction to MHP – Provides an overview of the components and functions of the MHP.

Chapter 2: Installation – Instructions to install and test the hardware and software components of MHP.

Chapter 3: SCS Printer Emulation Setup – Setting up SCS (SNA Character Stream) Printer Emulation.

Chapter 4: SCS Printer Customization – How to customize the SCS Printer Emulation to your particular work environment.

Chapter 5: SCS Printer Emulation Operation – Instructions on how to use SCS Printer Emulation.

Chapter 6: FormPort Flash Configuration – Directions and procedures for configuring FormPort Flash.

Chapter 7: FormPort Flash Operation – Using FormPort Flash.

Chapter 8: IPDS Setup – How to set up IPDS (Intelligent Printer Data Stream).

Chapter 9: Configuring IPDS – Detailed instructions for how to configure IPDS.

Chapter 10: Troubleshooting – Some common problems and their solution.

In addition, the following appendixes containing handy reference material are included in the back of this user guide:

Appendix A: IPDS Advanced Features – Complete listing of all the IPDS configuration options in alphabetic order.

Appendix B: IPDS Fonts – Includes a table that shows how IPDS fonts are mapped to PCL fonts when the "Font Mapping" parameter is active.

Appendix C: Paper Source PCL Tray Reference – Convenient list of codes to indicate the paper source on several supported printers.

Throughout this user guide, the following icons are used to denote important sections of text:

Highlights procedures that if not heeded, could damage the product or adversely affect the functionality.

Provides useful information relevant to the described feature or procedure.

Offers a tip, shortcut or useful information.

Special Acknowledgment

The SCS and IPDS printer emulation software is written by I-O Corporation. For further information regarding I-O Corporation's products and services, refer to www.iocorp.com.

Multi-Host Print License Agreement

IMPORTANT: Please read this License carefully before using the included "Multi-Host Print Software, CapSpool, CX Player, IPDS Player, or the Windows Configuration Manager," hereinafter referred to as "SOFTWARE." The right to use this SOFTWARE is granted only if you agree to the terms of the license. USE OF THIS SOFTWARE INDICATES YOUR ACCEPTANCE OF THE TERMS AND CONDITIONS OF THE LICENSE AGREEMENT.

In return for the payment of a one time license fee which was included in the purchase price of the Capella Technologies "Multi-Host Print" product, you are granted a non-exclusive right to use the SOFTWARE subject to the following terms and conditions. No title or ownership of the SOFTWARE is conferred with the license.

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2. The SOFTWARE may not be disassembled, decompiled, decrypted, or reverse engineered unless prior written consent is either obtained or not required by law. Upon request, the user will provide reasonably detailed information regarding any disassembly, decompilation, decryption, or reverse engineering.
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4. We reserve the right to terminate this license upon breach. In the event of termination, all copies of the SOFTWARE must be returned or, with prior written consent, a certificate of destruction of all copies may be provided.

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Chapter 1: Introduction to MHP

The Multi Host Printing (MHP) solution from Capella Technologies is an in-printer solution that gives HP LaserJet printers and LaserJet Multi-Function Printers (MFPs) the ability to automatically process IPDS and SCS data streams and optionally convert SCS data streams to “enhanced” SCS-FormPort documents. These enhanced SCS documents can contain formatted text, barcodes, logos, images... everything one needs to output checks, invoices, statements, estimates and other graphically oriented business documents. In short, enhanced SCS documents provide a viable alternative to IPDS without the need for IPDS equipped server hardware.

Unpacking

Check the packaging for water or physical damage, and notify the carrier immediately if any damage is evident.

Keep the original packaging just in case anything needs to be moved or shipped. The following items are included in the package:

- A Capella Technologies DIMM or CompactFlash Card. This hardware component must be installed into the HP LaserJet printer or MFP.
- A CD-ROM containing all the required software and documentation and samples.
    - Getting Started Guide
    - Quick Installation Guides
    - CapSpool Print Spool Utility
    - FormPort Configuration Tool
    - Sample SCS Data Files and CX Player print utility
    - Sample FormPort Flash Forms and associated Data Files
    - Sample IPDS Data Files and IPDS Player and print utility

MHP Components

MHP consists of three primary components: SCS, FormPort Flash and IPDS. The following pages describe each of these components in detail.

SCS Printer Emulation Component

The SCS (SNA Character Stream) Printer Emulation component provides a means of connecting to an IBM host system to print SCS jobs.

The SCS component converts SCS data streams from IBM's proprietary EBCDIC character set and SCS command structure to the ASCII character and PCL command language. This feature frees the host of the often-heavy overhead associated with this task.

FormPort Flash

FormPort Flash (FPF) is a complete document formatting solution that gives users the ability to automatically convert raw plain-text data streams into professional, graphics-rich documents, without modifying the host applications or data streams. The MHP solution includes printer resident storage that FormPort Flash uses to store user-defined Job Definition files (Forms) within the printer. These job definitions position the text fields output by enterprise applications and format it in a variety of fonts and sizes. Forms can also include photos, logos and other graphics, providing a completely customizable document formatting solution. For organizations that rely upon numerous forms with substantial graphics, MHP can also utilize the printer's internal hard drive, if one is available.

IPDS

The IPDS (Intelligent Printer Data Stream) component of MHP provides a means of connecting to an IBM host system and then printing native host IPDS jobs.

The IPDS Printer Emulation component converts native IBM IPDS print jobs from IBM's proprietary EBCDIC character and IPDS command structure toa LaserJet compatible format. This feature frees the host of the often-heavy overhead associated with this task.

Utilities

CX Player

The CX Player is a demonstration and diagnostic tool to show how a HP LaserJet printer with the MHP solution installed will print native IBM SCS print jobs.

ONLY SCS DEMONSTRATION FILES PROVIDED ON THE CD CAN BE USED WITH CX PLAYER.

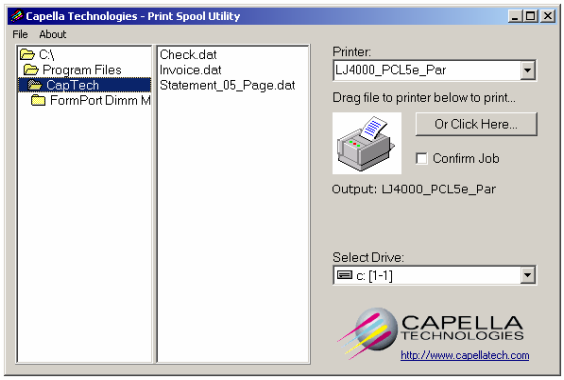
IPDS Player

The IPDS Player is a demonstration and diagnostic tool to show how a HP LaserJet printer with the MHP solution installed will print native IBM IPDS print jobs.

ONLY IPDS DEMONSTRATION FILES PROVIDED ON THE CD CAN BE USED WITH IPDS PLAYER.

CapSpool Print Spool Utility

CapSpool (shown in the figure below) is a convenient Windows utility that can be used to send the Multi-Host Print Test files and Firmware Update Files to the printer without typing commands from a command prompt. The LaserJet Embedded Web Server's *Print* function may also be used from a browser to send the test files to the MHP printer.



Supported Printers

MHP is currently available for numerous HP printers. To see a list of currently supported printers, refer to the README.TXT file located on the installation disc.

Installation Overview

The installation of MHP onto an HP printer is accomplished by performing the following steps:

1. Installing the hardware component of MHP onto a LaserJet DIMM, CompactFlash card, or Hard Disk.

2. Setup and Configuration of SCS, FormPort Flash or IPDS. See the component specific Configuration Sections for specialized instructions.

3. Validation of the Installation.

Chapter 2: Installation

This section describes the procedures required to install and perform a basic configuration of the MHP.

Hardware Installation

Installing the hardware component of MHP into the HP LaserJet must be done in accordance with HP's written instructions for each printer model. It is important that the DIMM or CompactFlash be installed in an appropriate slot. On some printers, there is a reserved slot. Placing the DIMM or CompactFlash card in the reserved slot may prevent the printer from initializing.

The following steps will guide you through the installation of the MHP CompactFlash in the LaserJet. It is suggested that you refer to your LaserJet's User's Guide for specific steps of installing optional CompactFlash cards.

1. Turn the printer on and print a LaserJet Configuration Page. Keep the Configuration page(s) until you have successfully installed the MHP solution.

2. **Power off the printer**.

3. Open the LaserJet's access door or if applicable, remove the formatter board.

4. Install the DIMM or CompactFlash:

    a. For DIMMs, hold the DIMM by the edges (don't touch the connector edge) and insert the DIMM into an available slot. Make sure that the retaining clips on each side are securely locked into place.

    b. For CompactFlash cards, hold the CompactFlash card by its edges and line up the groove in the side of the card with the tabs in the CompactFlash slot. Slide the CompactFlash into place.

Do not put the DIMM or CompactFlash into a slot reserved for printer system firmware.

5. Close the access door or re-install the printer's formatter board.

6. Power on the printer.

7. After the printer has completely booted and is once again ready, verify the installation was successful by printing a Hewlett-Packard configuration page. The "Installed Personalities and Options" section on the Configuration page should contain the following new entries:

   IOF 4(-): SCS(active) . . .
   IOF 15(-): FPF MHP Mgr(active) . .
   IOF 20(-): FormPort SCS(active). . .

   If these entries are not present on the HP configuration page, then the installation was not successful. This could be due to one or more of the following reasons:

   - The CompactFlash or DIMM was installed incorrectly. Power down the device and assure proper installation of the CompactFlash or DIMM.
   - The CompactFlash or DIMM does not support the HP LaserJet model in which it was installed.

8. Set the following LaserJet printer options from the printers Control Panel or by using the printers Embedded Web Server:

   - "Default Personality" set to "Auto."
   - I/O time out value set to 30 (this is a LaserJet setting not an IPDS or SCS menu setting)

The JetDirect network interface must also be re-configured to significantly reduce the time that is required to print IPDS jobs.

Though making this change is not difficult, it is suggested that a knowledgeable printer specialist execute this change.

The following steps will guide you through the process to enable the JetDirect interface's Buffer Packing option:

1. Start a Telnet session with the JetDirect card.
2. Type: menu, press **ENTER**.
3. Select option 2. TCP/IP Menu, press **ENTER**.
4. Select option 2. TCP/IP Print Options, press **ENTER**.
5. Select Y to change settings, press **ENTER**.
6. Set Buffer Packing to 1 = Enabled, press **ENTER**.
7. Select 0 to return to the Main Menu, press **ENTER**.
8. Select 0 to Exit Telnet, press **ENTER**.
9. Select Y to Save Settings, press **ENTER**.

9. After completing these steps, you will still need to perform additional configuration of the LaserJet printer and IBM host by following the detailed steps described later in this User's Guide.

Chapter 3: SCS Printer Emulation Setup

The SCS Printer Emulation enables the HP LaserJet printer to print eServer i5, iSeries, AS/400, or zSeries / S390 Mainframe Host native SCS print jobs.

Setup of the SCS Printer Emulation involves the following steps:

- Setup the IBM host. If the IBM host is an eServer i5, iSeries or AS/400, see the 5250 SCS Setup section below. If the IBM host is a zSeries / S390 Mainframe Host, see the SCS 3270 Setup section below.
- Setup the SCS printer session on the HP LaserJet printer
- Customization, as needed, SCS Printer Emulation at the LaserJet to adjust the final printing output.

Instructions for the first two steps are found in this chapter. Customization instructions are found in the following chapter

5250 SCS Setup

eServer i5, iSeries and AS/400 Setup

5250 SCS Printer Emulation communicates to the IBM host via TCP/IP using the TN5250e protocol. TN5250e is an extension of the Telnet display and printer protocol used in the IBM midrange systems.

IBM has limited the types of printers that can be configured in TN5250e to one type, a 3812-1 page printer. To the IBM host, the LaserJet printer looks just like an IBM dedicated printer.

To configure your eServer, iSeries or AS/400 to support TN5250e printing, the IBM host must meet the following requirements:

- Be running OS/400 V3R2 or newer, with the most recent applicable PTFs applied.
- Have the most recent version of Client Access installed on the host.
- Have the most recent version of the Telnet server installed on the host.
- Have the host's auto configuration function turned on.
- Make certain that the host can create virtual devices and there are a sufficient number of devices available to be created.

  This is done using the host command:

  CHGSYSVAL SYSVAL(QAUTOVRT) + VALUE(?)

  The "?" is the maximum number of user-created virtual devices that can be created.

- If the OS/400 version is earlier than V4R2, the Telnet server will need to be started using the host command:

  STRTCPSVR SERVER(*TELNET)

  V4R2 and newer versions will automatically start the Telnet server.

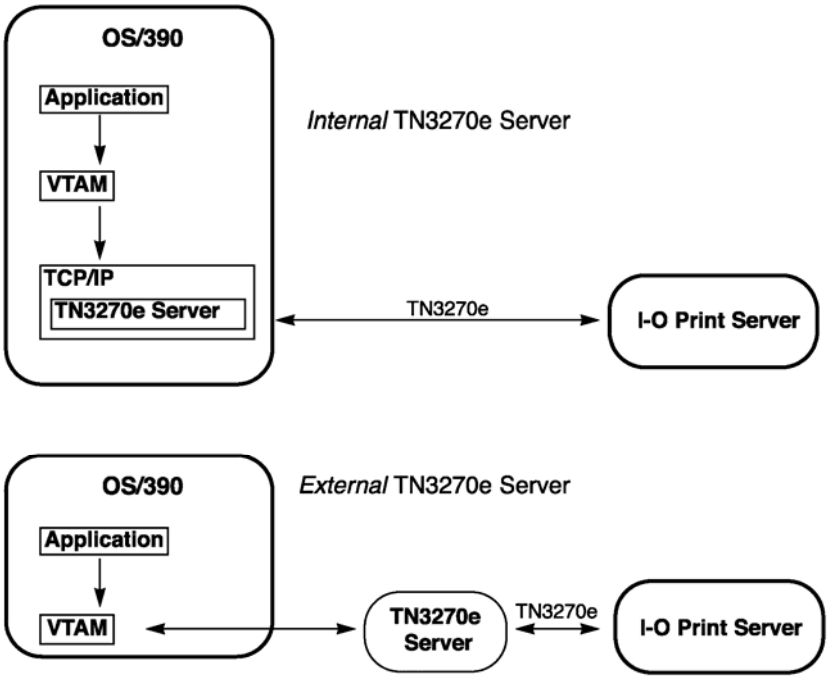
After these requirements are met, the IBM host will automatically configure the a printer device the first time the 5250 SCS Printer Emulation session connects with the host. The IBM host will create a 3812 page printer device and assign the device name you enter when setting up the 5250 SCS Printer Emulation session on the LaserJet printer.

3270 SCS Setup

zSeries / S390 Mainframe Host Setup

The 3270 SCS Printer Emulation communicates to the IBM mainframe via TCP/IP using the TN3270e protocol. TN3270e is an extension of the Telnet display protocol. IBM has limited to types of printers that can be configured in TN3270e to one type - a 3287.

Connection to the IBM mainframe is accomplished through a TN3270e server. The TN3270e server can be either internal to the IBM mainframe or externally attached, such as a channel or LAN-attached gateway. The 3270 SCS Printer Emulation session then accepts SCS or DSC (LU1 or LU3) data from the IBM mainframe application through TCP/IP. Printer messages are returned through the same TN3270e link.



In general, configuring the IBM mainframe to print to a LaserJet equipped with MHP is the same as configuring for a new TN3270e printer. The VTAM TCP/IP profiles are modified to indicate the Telnet device, the printer group name, the IP address group, and the printer map. JES is then modified to include the LaserJet destination id and description. Lastly the mainframes print application, such as JES23X or VPS, is configured for the remote printer.

Please refer to your IBM mainframe system administrator or other IT specialists for configuring the mainframe and Telnet server. Refer to the appropriate IBM mainframe and TN3270e server documentation for configuration instructions, such as OS/390 Communication Server - IP Configuration Guide # SC31-8725-001.

While configuring the printer device on the 3270 host, it is recommended that the CKPTPAGE value be set to a value of “10” or lower. This configuration option controls how many pages are transmitted from the host to the 3270 SCS Printer Emulation session before the host sends the actual print instruction. If the value is too large, loss of data could occur.

Once the mainframe and Telnet server are configured, the 3270 SCS Printer Emulation session must be configured in the LaserJet printer.

LaserJet SCS Printer Emulation Session Setup

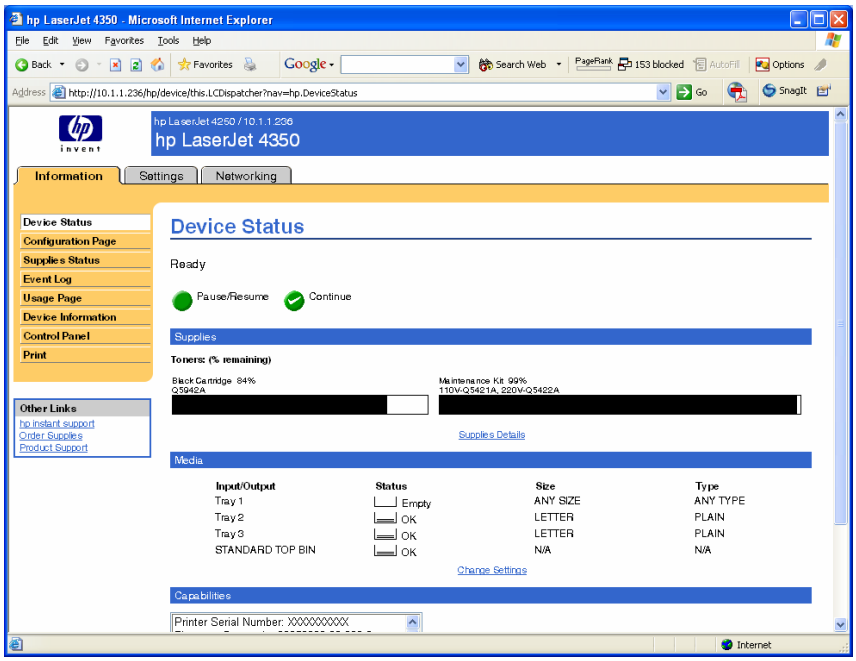
Setting up the LaserJet printer is done by entering the IBM host's IP address and the name that the SCS Printer Emulation session will be identified as on the IBM host.

THE IBM HOST INFORMATION CAN ONLY BE ENTERED THROUGH THE LASERJET'S WEB PAGE.

The following are the required steps to establish a SCS Printer Emulation session with the IBM host so that it can send SCS jobs to the MHP printer:

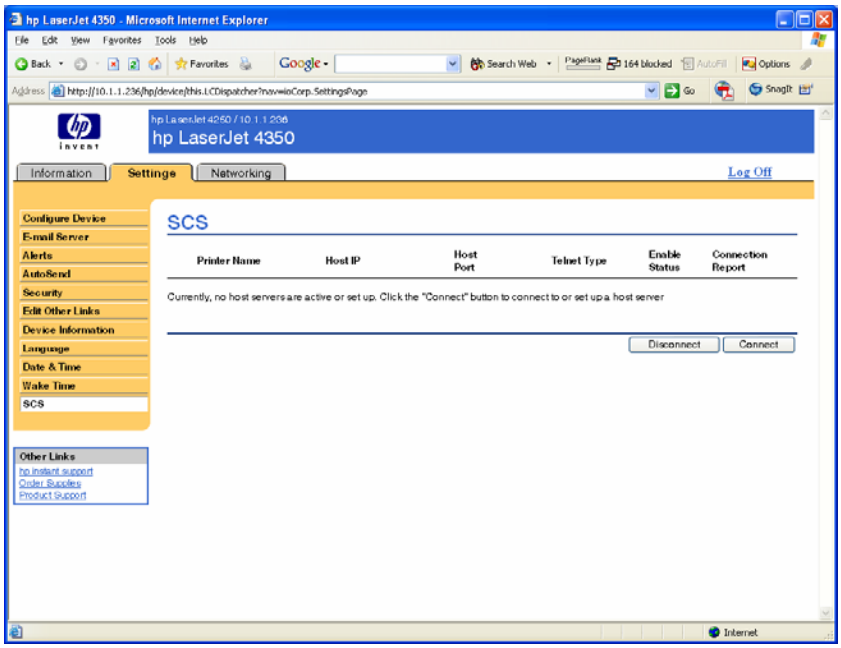
1. Start your Web Browser.

2. In the URL field, enter the IP address of the LaserJet that contains the MHP product.

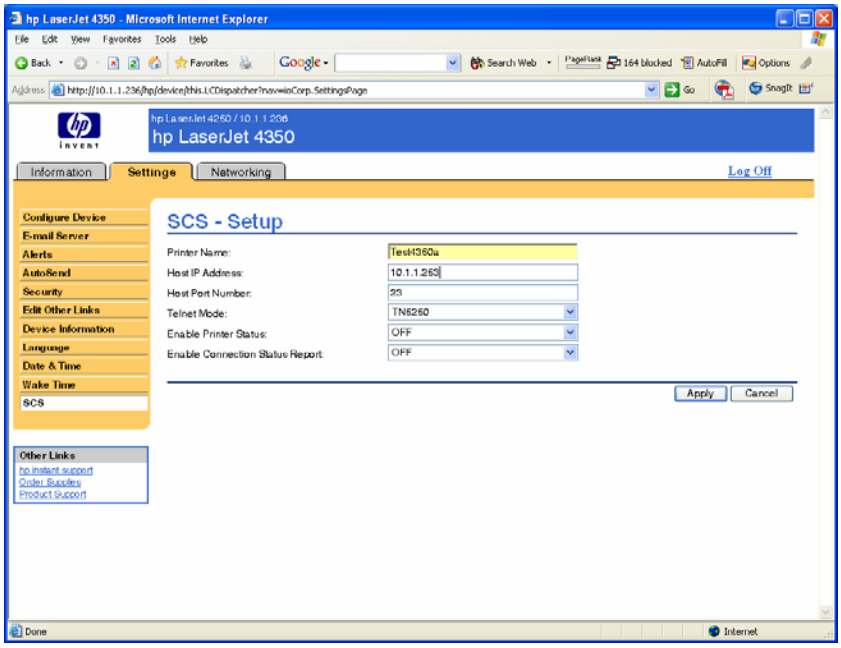


3. Click on the Settings tab, then on the SCS option in the left navigation bar and the following screen will appear.

Users may need to be logged in using the administrator's password for the Settings tab to be visible.



4. Click on the Connect button to display the following screen.



Enter the following information on this screen:

- **Printer Name:** Enter the name that the IBM host will use to identify this SCS Printer Emulation session. This is the name that will be used on the IBM host when sending print jobs to this printer.

- **Host IP Address:** Enter the TCP/IP address of the IBM host that this SCS Printer Emulation Session will be connected to.

- **Host Port Number:** Enter the IP port number that will be used to contact the IBM host. Generally this number will be 23. However, if there is a firewall that requires a different port number, use this field to enter that new port number.

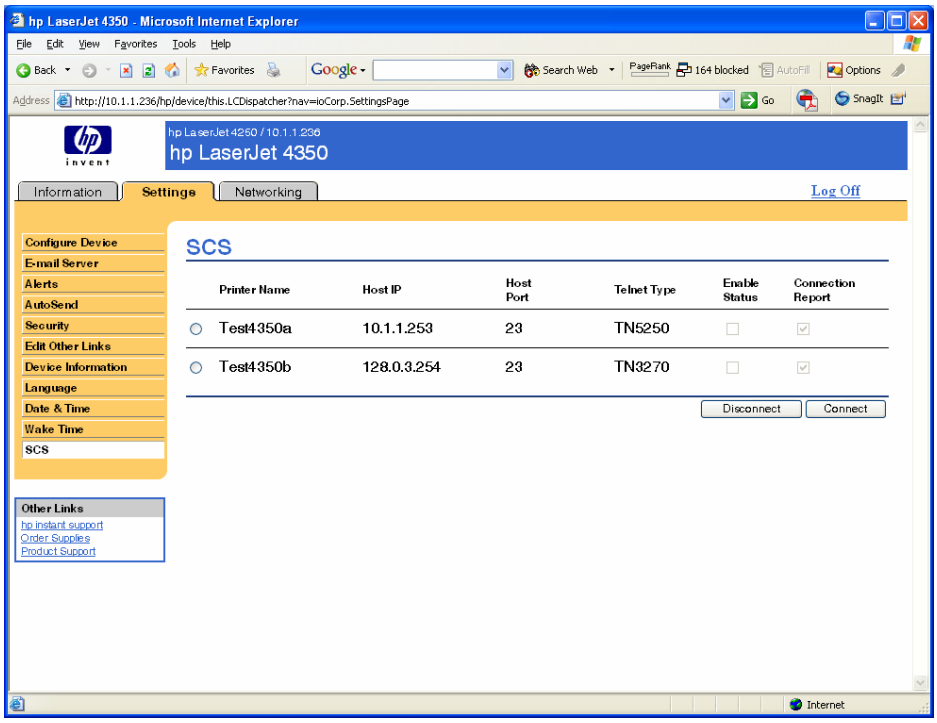
- **Telnet Mode:** Select from the drop down list TN5250 for connection to an eServer i5, iSeries or AS/400 host. Select from the drop down list TN3270 for connection to a zSeries / S390 Mainframe Host .

- **Enable Printer Status:** Select from the drop down list whether to enable sending the status of the print job to the host. For hosts running OS/400 V4R3 or earlier versions that do not have the most recent PTFs applied, it may be necessary to disable sending paper out and printer offline messages to the host. Otherwise the print jobs for the TN5250e printer sessions may hang up on the Host and not get printed.

  On some mainframe hosts, it may be necessary to disable sending paper out and printer offline messages to the host. Otherwise the print jobs for the TN3270e printer sessions may hang up on the Host and not get printed

- **Enable Connection Status Report:** Enables or disables the printing of a page showing the connection status between the SCS Printer Emulation session and the IBM host. This page will tell you if the SCS Printer Emulation session is communicating properly with the IBM host. It is suggested for at least the initial setup that this be enabled. Then once you are comfortable with the operation of the SCS Printer Emulation, you may turn off this feature.

After all values have been entered or selected, press the APPLY button. The following screen will appear.



Additional printer sessions may be configured to different IBM hosts. The sessions can be a mixture of both TN5250e and TN3270e sessions. To add additional sessions, click on the ADD button.

After printer session has been configured, the LaserJet will connect to the IBM host and a new printer session will automatically be created on the IBM host. If the connection status page function is enabled, a page will print showing the status of the connection between the SCS Printer Emulation session and the host. If the connection status indicates a good connection has been made, then the printer session is then ready to receive IBM host print jobs.

If there is a need to customize the way the print jobs are being handled by the SCS Printer Emulation, refer to ***Chapter 4: SCS Printer Customization.***

Sample Data Files (optional)

The CD contains a set of data files. These data file can be used along with the CX player to demonstrate the SCS capabilities. Here is a description of the files contained with-in the SCS directory on the CD:

README	Instruction on how to use CX Player.
CXplayer.exe	The CX player executable.
Check.dmp	Sample Data file.
Invoice.dmp	Sample Data file.

THE SCS SAMPLE DATA FILES CAN BE CONVERTED TO "enhanced" SCS FILES BY CONFIGURING FORMPORT FLASH WITH THE SAMPLE FORMS. PLEASE SEE THE FORMPORT CONFIGURATION CHAPTER FORM MORE DETAILS.

Chapter 4: SCS Printer Customization

This chapter describes how to configure the SCS Printer Emulation.

SCS Printer Emulation can be configured to change the way IBM host print jobs are actually printed. Options include the ability to set the final print quality (draft or near-letter quality), the characters per inch used, etc.

Customization can be done in three different ways:

- Using the HP LaserJet's Web page
- Using the HP LaserJet printer's front panel
- Using the robust and feature-rich Host Download Commands

Web Page Configuration

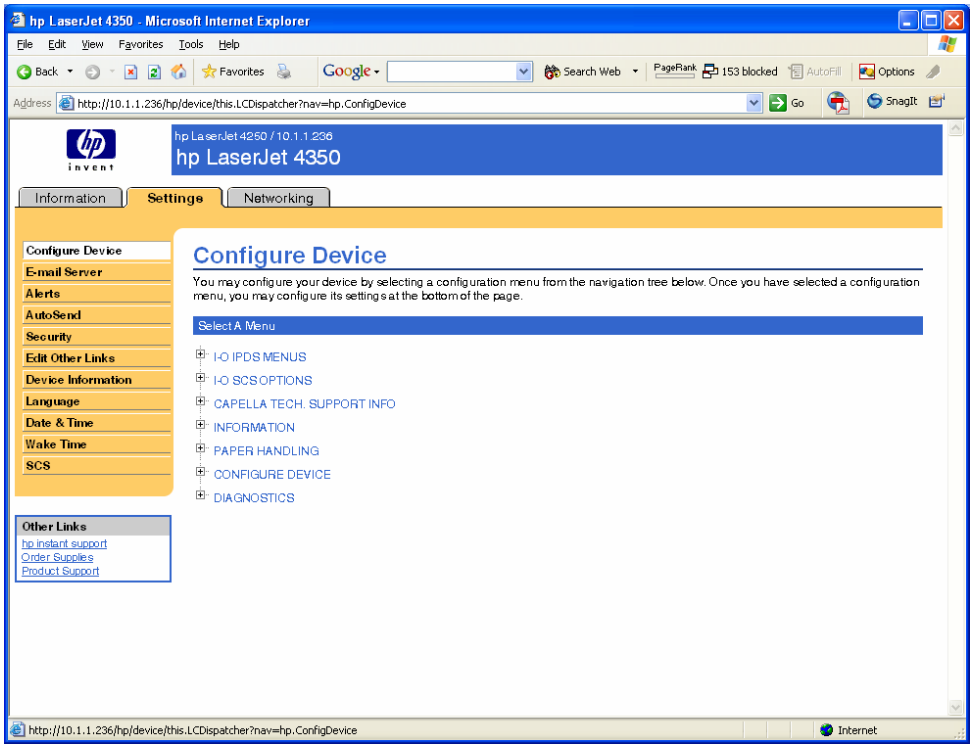
To configure the SCS Printer Emulation session via the printer's internal Web server, using the Web browser on a PC navigate to the printer's URL (the printer's IP address).

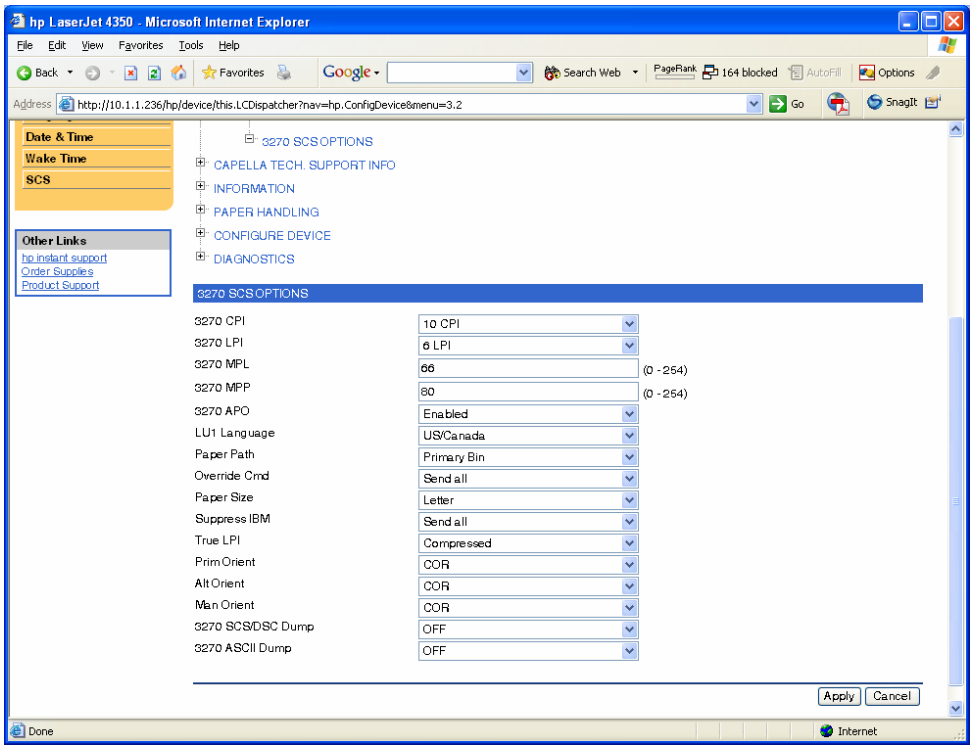
Generally you will find the SCS menu under the Settings section. However, because the Web pages differ from printer model to printer model, you may need to search around on the printer's Web pages to locate the SCS menu. You can then customize the SCS Printer Emulation configuration values right on the PC's screen.

Not all LaserJet printers are capable of providing a web page. Generally, LaserJet printers introduced during 2004 and later are capable of serving up a web page.

After all menu options have been selected, it is recommended that you print a copy of the Menu Map. This shows the current settings for all the printer's various configuration options.

The following are samples of the Web pages for the HP 4350 LaserJet.





Front Panel Configuration

To configure the SCS Printer Emulation via the front panel, press the main menu button until you reach the sections to configure the SCS option. Prior to changing any options via the front panel, it is recommended that you print a Menu Map. The Menu Map shows all menu settings and may be helpful if you decide to return to a previous setting.

After you reach any of the SCS setup menu, you may step through the different settings by using the "item" button. Individual selections within each menu item can be addressed with the "value" button. Active menu selections are noted by an asterisk (*). To select a different setting than the active one, use the value button until your desired option is displayed and save it using the "select" button.

After all front panel options have been selected, it is recommended that you print a copy of the Menu Map.

Not all SCS configuration options can be accessed through the printer's front panel. Refer to the table in each of the following sections to see what commands are available.

5250 Host Download Commands

Host Download commands are basically strings of text that are sent from the IBM host to the 5250 SCS Printer Emulation session that will configure the print job. All configuration parameters pertaining to the IBM printer emulation can be modified using Host Download commands.

The following table shows the available 5250 configuration options listed in alphabetical order. The middle column gives the Host Download Command number. The last column identifies if the configuration parameter also appears on the LaserJet's front panel and Web page. Following the table is the detailed explanation of each configuration parameter in numeric order.

Configuration Parameter	*Host Download Command Number*	*Web Page and Front Panel Option*
ASCII Dump	43	✓
Automatic Page Orientation	08	✓
Character Set	17	
Command Pass-Thru Default	44	
CPT End Delimiters	02	
CPT Start Delimiters	01	
Duplexing	33	
EBCDIC Dump	42	✓
Horizontal Margin	19	
Host Language	05	✓
IBM Drawer 1	13	✓
IBM Drawer 2	14	✓
IBM Drawer 3	15	✓
IBM Drawer 4	30	✓
IBM Drawer 5	31	✓
Lines Per Inch	10	✓
Orientation	07	✓
Override Host Formatting	16	
Paper Size	09	✓
Process Left Margin Before/After Command Pass-Thru	35	
Save Current Settings	99	
User Defined Fonts	21	
User Defined Strings	04	
Vertical Margin	18	

For a complete description, syntax and examples of the 5250 Host Download Command Numbers, refer to the ***Multi-Host Printing Advanced Features Guide***.

3270 Host Download Commands

Host Download commands are sent from the IBM 3270 mainframe to the 3270 SCS Printer Emulation session as part of a print job. All configuration parameters pertaining to the 3270 SCS Printer Emulation session can be modified using Host Download commands.

The following table shows the available configuration options in alphabetical order. The middle column gives the Host Download Command number. The last column identifies if the configuration parameter also appears on the LaserJet's front panel and Web page. Following the table is the detailed explanation of each configuration parameter in numeric order.

Configuration Parameter	*Host Download Command Number*	*Web Page and Front Panel Option*
Alternate Paper Tray Orientation	63	✓
Auto Print Tray Orientation	61	✓
Automatic Function at End of Job	20	
Character Set Selection	65	
Characters Per Inch	03	✓
Command ID Character	41	
CPT Ending Delimiter Characters	39	
CPT Start Delimiter Characters	40	
CR at MPP+1	15	
Custom User Strings	55	
FF after Timeout	27	
FF Valid Location	19	
FF after Local Screen Copy	13	
FF before Local Screen Copy	12	
FF Usage	25	
Form Length	05	✓
Intervention Required Timeout	34	
Line Spacing	04	
Lines Per Inch	02	✓
LU1 Language	08	✓
LU3 Print Image (Non-SCS Mode)	14	
Manual Paper Tray Orientation	64	✓

Configuration Parameter	Host Download Command Number	Web Page and Front Panel Option
Maximum Print Position	06	✓
NL at MPP+1	16	
Override Formatting Commands	30	✓
Overwrite DSC (LU3) Translation Table	71	
Overwrite EBCDIC (SCS/LU1) Translation Table	70	
Paper Path	11	✓
Paper Size	32	✓
Primary Paper Tray Orientation	62	✓
Print Case	07	
Restore Defaults or Configuration	98	
SCS TRN Translate	45	
Start / Stop ASCII Hex Dump	42	✓
Start / Stop EBCDIC Hex Dump	43	✓
Store Configuration in Permanent Memory	99	
Suppress Empty Forms	26	
Suppress IBM Control Codes	36	✓
True LPI Spacing	38	✓
Truncate/Wrap Select	31	
Valid FF at End of Print Buffer	18	
Valid FF followed by Data	17	
Vertical Channel Select (VCS)	37	

For a complete description, syntax and examples of the 3270 Host Download Command Numbers, refer to the ***Multi-Host Printing Advanced Features Guide***.

Chapter 5: SCS Printer Emulation Operation

This chapter describes in more detail the 5250 SCS printer operation. Also described are advanced printing features that are designed into the SCS Printer Emulation.

5250 Printer Emulation Operation

The SCS Printer Emulation is designed be installed in an HP LaserJet equipped with a JetDirect interface for connection to an Ethernet LAN. Connection to the IBM host is done over Ethernet using the TCP/IP printing protocol of TN5250e.

On the IBM host side, TN5250e is a self-configuring protocol that creates an IBM 3812-1 page printer device description and writer. Print jobs from the host are sent to printer in the EBCDIC character set and with SCS commands. The EBCDIC characters are converted into ASCII and the SCS commands are converted into PCL commands. The LaserJet then interprets the PCL generating the printed output.

Running a 5250 SCS Printer Session

The 5250 SCS Printer Emulation session will automatically connect to the IBM host when the following occurs:

- The session is first configured on the LaserJet printer
- The printer is powered up.

To end the connection with the IBM host, do one of the following:

- Use the printer's Web interface to disconnect the session(s). Do this by starting a browser, navigate to the printer's IP address, select the Settings tab and then the SCS menu. Click on the SCS session and click the Disconnect button. This method will cause the IBM host to immediately shut down the session.
- Power down the printer.

When the LaserJet printer is powered off, the IBM host will not immediately end the connection. After a time-out period that varies from 15 minutes to several hours, the IBM host will eventually end the connection and allow reconnection. If the printer is powered up within this period, the IBM host will refuse to allow the 5250 SCS printer emulation session to reconnect.

To cause the IBM host to immediately end the connection and allow reconnection, either of two processes may be used:

Vary off the Device

1. End the writer.
2. Vary off the device.
3. Cycle the power on the printer.

End the Telnet session:

1. End the Telnet session by using the eServer i5, iSeries AS/400's TCPADM command. (You may also use the NETSTAT command, option 3 as an alternate.)
2. At the command line, type GO TCPADM, take selection "7", then "3".
3. Find the IP address for the LaserJet that runs the 5250 SCS Printer Emulation session, then execute option "4 - End of Session".
4. Cycle the power at the printer.

3270 Printer Emulation Operation

The 3270 Printer Emulation module emulates a 3287, 3262, 3268, 3812-1, 4028, 4214 or 4224 SCS printer on your 3270-type host system.

Refer to the appropriate IBM documentation and related reference material for instructions and processes to run the TN3270e printing functions.

Chapter 6: FormPort Flash Configuration

This chapter contains information and instructions to configure FormPort Flash after installation. In general, configuration of the FormPort Flash component consists of loading Forms definition files and setting triggers for those forms. There are two methodologies for configuring FormPort Flash:

- Web Configuration
- Using CapSpool to copy installation files to the printer.

Web Configuration

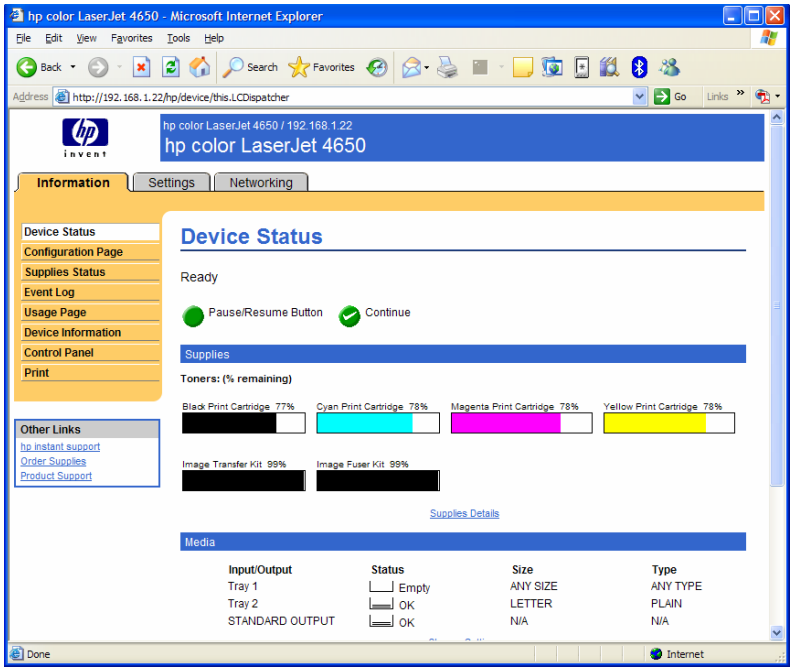
To configure the FormPort Flash via the printer's internal Web server, use a Web browser on a PC to navigate to the printer's URL (the printer's IP address).

Generally you will find the FormPort Flash menu under the Settings tab. However, because the Web pages differ from printer model to printer model, you may need to search around on the printer's Web pages to locate the FormPort Flash configuration page.

The following steps are required to install Form Definition Files:

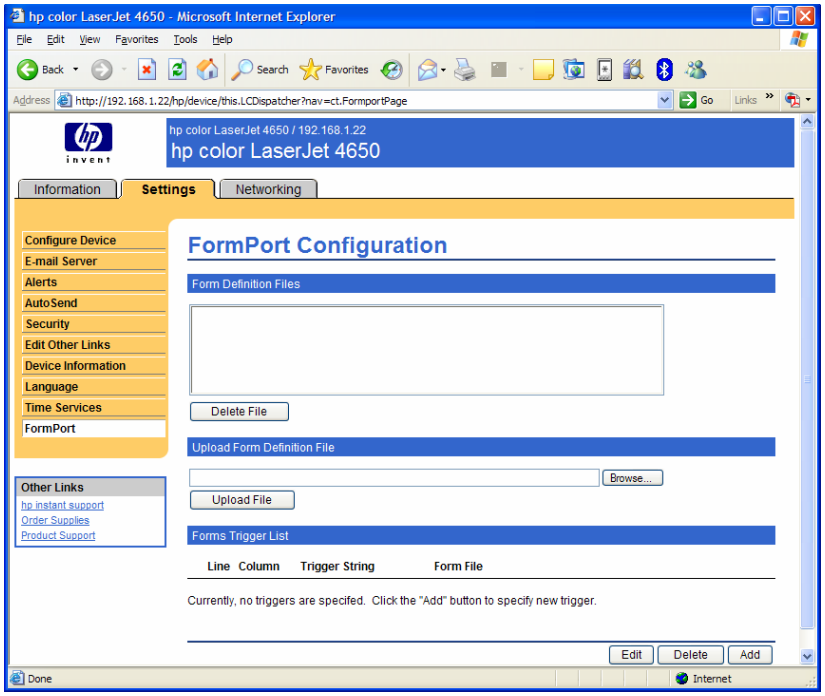
1. Start your Web Browser.

2. In the URL field, enter the IP address of the LaserJet that contains the MHP product.

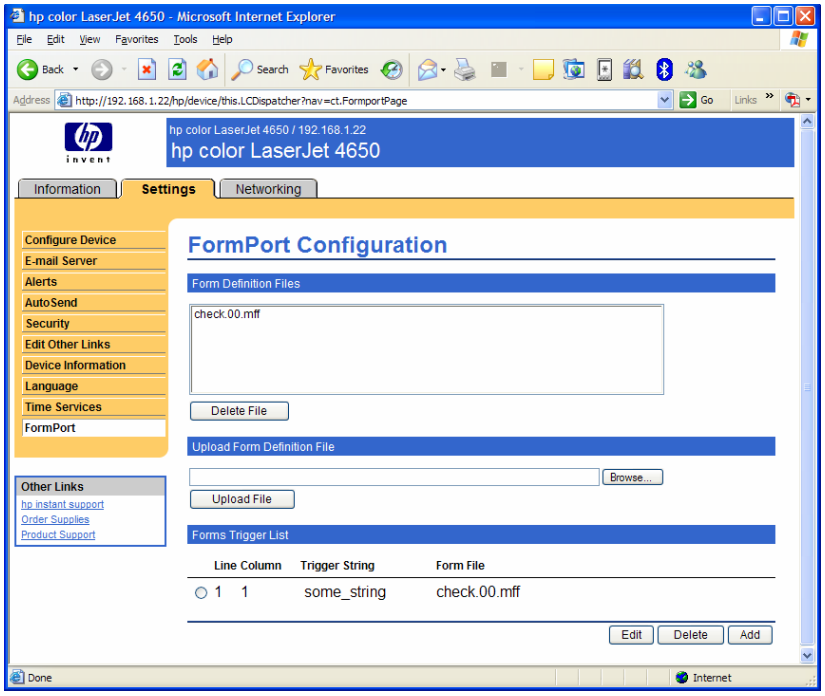


3. Click on the Settings tab, then on the FormPort option in the left navigation bar.

Users may need to first log in using the administrator's password for the Settings tab to be visible.



4. Use the control buttons on the page to Upload Files, Delete Files, or add Form Triggers.



Installing Sample Forms (optional)

The Sample Forms should never be installed or removed by "sending a file to the printer" if you are upgrading a previous version of FormPort Flash, or if you currently have forms installed in the printer. Doing so will cause any previous Form Definition settings to be lost.

The CD contains a set of sample forms within the FormPort Flash directory. Here is a description of the files contained with-in the directory:

Ins_FPD6_SampleForms_xx.rfu	File to Install the Sample Forms and Triggers.
Rem_FPD6_SampleForms.rfu	File to Remove the Sample Forms and Triggers.
check.fpf	Sample CHECK Form.
invoice.fpf	Sample INVOICE Form.
Check.txt	Sample Data file for the CHECK Form.
Invoice.txt	Sample Data file for the INVOICE Form.

Using Web Configuration to Install Sample Forms

Follow "Web Configuration" steps outlined above to upload Sample Forms (.fpf files) and configure Triggers. Below are appropriate Trigger settings for the associated forms:

Form Name	Row	Column	Trigger String
check.fpf	3	91	Capella
invoice.fpf	8	9	Attn:

Using CapSpool to Install the Sample Forms

Sample Forms can be installed in the printer by sending the **Ins_MHP_SampleForms.rfu** file to the printer. The printer data light will blink while the Forms are stored in the printer, and then a list of the installed Forms and their associated Triggers will be printed..

The **Check.txt** and **Invoice.txt** files are text-only files that will automatically trigger the previously-loaded Sample Forms. Verify the FormPort Flash installation by copying the **Check.txt** and the **Invoice.txt** files to the printer using CapSpool or through a command prompt. These files will produce a check or an invoice document.

The Sample Form files may be removed from the printer by sending the **Rem_MHP_SampleForms.rfu** file to the printer.

Once the sample forms and trigger have been configured on the device, the CapSpool can be used to send the Sample Data files (.txt) .

Chapter 7: FormPort Flash Operation

Understanding FormPort Flash

A FormPort Job is defined as:

> *"Any SCS or plain text job that contains information that is intended to be used with an existing Printer-Resident Job Definition (Form) to first Format and then Print a finished FormPort document."*

The FormPort Flash component of MHP parses SCS and plain text jobs that are sent to the printer and looks for matches between the input printer data stream and the information contained in pre-defined Form and Job Triggers.

The printer must be configured to PERSONALITY=AUTO mode or the job won't be recognized by FormPort Flash.

FormPort Job Triggers

The FormPort Flash Job Triggers are listed in the ***Internal Form Definitions*** section of the Capella Technologies Configuration Page.

The Job/Form Definitions are printed with the Highest-Order Definition First, and the Lowest-Order Definition Last. The Search Criteria for "Auto-Triggering" a FormPort Job/Form is as follows:

Highest Priority
Trigger Line
Trigger Column
Trigger String (upper/lower case, case sensitive)
Form Name (upper/lower case, case sensitive)
Lowest Priority

This sort-order priority is used to insure that different printers with the same definitions in the FormPort Flash Configuration file—but entered in a different line-entry order—always use the same form when a FormPort Flash Job is printed.

It's possible that a Job/Form Definition is listed on the page but is never used to trigger a form. This situation occurs if there is more than one entry with the same line, column, and search-string, but different form names. In this case, the "tie" is always broken by the Form-Name that is the closest to the top of the FormPort Flash Internal Form Definitions list.

Using a Default Form

Normally the FormPort Flash "Trigger-Line" numbers range from 1-225 and the "Trigger-Column" numbers range from 1-512. A Form is only selected for printing if the input data at the Trigger-Line/Trigger-Column position exactly matches the text specified by the Trigger-String.

In certain cases (such as printing reports), a Trigger-String can't be uniquely specified even though the format for the printed document is always the same. The FormPort Flash provides a Default Form capability to cover these situations. By specifying the Trigger-Line and the Trigger-Column as position 0 (zero), the Form-Name is treated as a Default Form and the Trigger-String field is subsequently ignored.

If a Default Form has been specified, and a job is determined to be a FormPort Job but the input data doesn't match any of the pre-defined Trigger-String entries, then instead of ignoring the job the FormPort Flash formats the job using the Default Form.

If there is more than one Default Form specified, only the Default Form at the top of the Definition List is used.

Printing the FormPort Job/Form Definitions

There are several ways that the Job/Form Definition information contained on the Capella Technologies Configuration Page may be printed:

1. From the printer Front Panel, select the “Print Capella Support Info” item in the “Capella Tech. Support Menu”

2. Connect to the printer’s Web Server and select the Settings Tab.

   Under Configure Device, select ***Capella Tech. Support Info***.

   Check the box in the “Print Capella Support Info” Section and then click the Apply button to print the Cappella Configuration Page.

3. Manually send the following “Print Capella Configuration” command to the printer:

   <Esc>%-12345X@PJL
   @PJL ENTER LANGUAGE=PCL
   <Esc>%-20001X<Esc>%-12345X

The Capella Configuration Page also contains contact information in the event you need to contact Capella Technologies.

Chapter 8: IPDS Setup

In this chapter you will configure the IBM eServer i5, iSeries or AS/400 or mainframe – zSeries host as well as customize the MHP printer to obtain successful IPDS printing.

IBM Mainframe Configuration

The basic configuration of the printer's Ethernet connection should already have been completed for TCP/IP Printing. The printer's IP address is found on the printer's configuration page. If you cannot find it, contact your System Administrator. Additional IPDS configuration options for the MHP printer can be set through either the printer's front panel, the printer's Web page or by using host download commands. These functions are described later in this chapter.

Several steps are required to configure the MVS system to print AFP/IPDS files to an MHP printer installed via PPR/PPD (TCP/IP). These are:

1. Define the MVS communications control units to MVS.
2. Modify the TCP/IP profile on your MVS system.
3. Ping the printer.
4. Define the printer as a writer-controlled printer to JES.
5. Define the printer to PSF/MVS with PRINTDEV.

This section does not provide all the information you need to install and configure TCP/IP on your MVS system.

For more information, refer to IBM publications TCP/IP for MVS: Customization and Administration Guide, or PSF V3R1.0 for OS/390 Customization, or PSF/MVS: System Programming Guide.

Requirements

Make sure that you have at least the following or newer, installed and configured on your system:

- PSF/MVS Version 2.2.0 with APAR OW15599
- MVS Scheduler with APRA 0212236
- TCP/IP Version 3 Release 1 or higher, installed and configured on MVS

To obtain the PTF's associated with these APAR's, contact the IBM Support Center.

Define the Communications Control Unit to MVS

If you have not already done so, define the communications control unit (such as a 3172) on the MVS system. Use either an MVS configuration program (MVSCP) or a hardware configuration definition (HCD), depending on the version of your MVS system:

- When using a version earlier than MVS 4.1.0, use an MVSCP.
- When using a version of MVS 4.1.0 or later, use an HCD or an MVSCP

For more information about using these methods, refer to the IBM publications MVS/ESA Migration Planning: Dynamic I/O Configuration or MVS/ESA Hardware Configuration: Using the Dialog.

Modify the TCP/IP Profile in MVS

The TCP/IP profile contains system configuration statements used to initialize the TCP/IP address space. Some statements require special considerations when you are printing from PSF/MVS. The following example shows the specific statements that require consideration shown in bold:

ACBPOOLSIZE	1000	
ADDRESSTRANSLATIONPOOLSIZE	1500	
CCBPOOLSIZE	150	
DATABUFFERPOOLSIZE	**160**	**32768**
ENVELOPEPOOLSIZE	750	
IPROUTEPOOLSIZE	300	
LARGEENVELOPEPOOLSIZE	50	
RCBPOOLSIZE	50	
SCBPOOLSIZE	256	
SKCBPOOLSIZE	256	
SMALLDATABUFFERPOOLSIZE	**256**	
TCBPOOLSIZE	512	
TINYDATABUFFERPOOLSIZE	**256**	
UCBPOOLSIZE	100	

KEEPALIVEOPTIONS INTERVAL 10 SENDGARBAGE FALSE

ENDKEEPALIVEOPTIONS GATEWAY

; * Network	First hop	Linkname	Packet Size	Subnet mask	Subnet value
9	=	BPCLAN	2000	0.255.255.0	0.99.12.0
DEFAULTNET	9.99.12.254	BPCLAN	2000	0.255.255.0	0

The following is a description of each statement that needs special consideration, the application and the changes they make necessary. Be aware that if you change any of the values in the TCP/IP profile, you will need to restart TCP/IP in order for the changes to take place.

DATABUFFERPOOLSIZE - defines the number and size of the data buffers. It is recommended that you specify 160 data buffers and a buffer size of 32768.

SMALLDATABUFFERPOOLSIZE - defines the number of small data buffers. It is recommended that you specify at least 256 small data buffers.

TINYDATABUFFERPOOLSIZE - defines the number of tiny data buffers. It is recommended that you specify at least 256 tiny data buffers.

KEEPALIVEOPTIONS - PSF relies on TCP to detect when a connection with a printer is no longer usable. When no data has been exchanged between PSF/MVS and the printer, TCP periodically sends keep-alive probes to the printer. These periodic probes, called keep-alive transmissions, enable TCP to discover when a connection is no longer usable, even if the printer is abruptly powered off or is no longer accessible through the network.

The frequency of keep-alive transmissions is controlled by the INTERVAL parameter on the KEEPALIVEOPTIONS statement. The frequency applies to all TCP applications that direct TCP to send keep-alive transmissions. The default frequency is after about two hours of inactivity.

When printing IPDS on an MHP printer, it is recommended that you specify a shorter interval than the default, such as 10 minutes, for the interval between keep-alive transmissions. Also, if any target host requires that the keep-alive packet contain data, include the statement SENDGARBAGETRUE.

GATEWAY - The Packet_size parameter of the GATEWAY statement defines the maximum transmission unit (MTU) for the MVS host. For network printers, the MTU size is fixed at 1024 bytes. The value cannot be adjusted.

Verify the Printer Connection

Ping the Printer

To verify that the IBM MVS system can establish a connection with the printer, ping the printer from the MVS system.

- From a TSO session, enter the following: **TSO Ping ip_address**
- In JES2, enter the following command from the System Display and Search Facility (SDSF) menu 6: **ping ip_address**

The **ip_address** specifies the IP address of the NIC. The following shows examples of a successful ping and an unsuccessful ping.

Successful ping:

EZA04581 Ping V3R1: Pinging host 9.99.12.33
(Use ATTN to interrupt.)
EZA04631 PING: Ping #1 response took 0.084 seconds. Successes so far = 1.

Unsuccessful ping:

EZA04581 Ping V3R1: Pinging host 9.99.12.33
(Use ATTN to interrupt.)
EZA04631 PING: Ping #1 timed out.

Handling MVS Connectivity Problems

If you encounter problems when pinging the printer from MVS, here is how to resolve them:

Ping is not Successful

If the ping is not successful, verify the following:

- The printer is powered on.
- The IP address is unique in the TCP/IP network. If the IP address of the MVS system is not unique, contact your system administrator.
- The Maximum Transmission Unit (MTU) size of the IP packet for the MVS system is equal to the MTU size of the network printer that is fixed at 1024. To change the MTU size for the MVS system, change the GATEWAY statement in the MVS TCP/IP profile and restart TCP/IP to activate the changes. If these items are in order, consult your system administrator about a possible network problem.

Ping is Successful

A successful ping usually indicates that the MVS system can communicate with the printer, however, you might receive a successful ping even though the IP address of the printer is a duplicate of another IP address. If PSF is unable to establish a network connection with the printer or if PSF output for the printer prints elsewhere, follow these steps to determine whether the IP address of the printer is unique:

1. Turn off the printer.

2. Wait at least 5 minutes for TCP/IP to clear the Address Resolution Protocol (ARP) tables. (If your installation specified a longer interval on the ARPAGE configuration statement in the TCP/IP profile, you may need to wait longer. For information about the ARPAGE statement, refer to the IBM TCP/IP MVS Customization and Administration Guide.)

3. Enter the ping command again from the MVS system. If you receive a successful response to the ping command, there is a duplicate IP address. Consult your system administrator.

Define the Printer to JES

When MHP is used with JES, it must be defined for deferred printing mode with JES.

- The JES2 printer definition initialization member, located in the system PARMLIB is shown below:

  ```
  FSS (FSS1), PROC=PSFPROC,HASPFSSM=HASPFSSM
  PRT1    FSS=FSS1,MODE=FSS,PRMODE= (LINE,PAGE,SOSI1),
  CLASS=C, UCS=0, SEP, NOSPEPDS, CKPTPAGE=100
  DRAIN, MARK, TRKCELL=YES
  ```

  The above example is correct for JES2 3.11 and above. For earlier versions of JES2, the statement is FSSDEF and would be stated as FSSDEF FSSNAME=FSS1.

The value specified for the PROC parameter must match the name on the PSF/MVS startup procedure.

- The JES3 printer definition is shown below. This example is not executable, but is intended to help the JES3 systems programmer define the printer to the MVS host.

  FSSDEF, TYPE=WTR, FSSNAME=FSS1, PNAME=PSFPROC,
  SYSTEM=SYS1, TERM=NODEVICE, JNAME=PRT1,
  JUNIT=(,SYS1,,OFF), FSSNAME=FSS1, MODE=FSS,
  PM=(LINE,PAGE,SOSI1),CHARS=(YES,GT12),

  The value specified for the JNAME parameter must match the name of the printer in the PSF/MVS startup procedure.

  The value specified for the PNAME parameter must match the name on the PSF/MVS startup procedure.

Define the Printer to PSF/MVS

Each printer must be defined to PSF with a PRINTDEV statement in the PSF/MVS startup procedure.

Currently, IBM does not supply a network printer-specific writer procedure. (Remember that the printer appears to the IBM mainframe as a network printer.) However, the APSWPROT sample from the APAR medium (noted above in Section 8.2.1) can be copied and modified for network printers.

Make sure that you specify 300-pel font libraries even though the printer may support higher resolutions. The following is a sample procedure (PSFPROC) that can be modified to suit your installation.

The following is a description of the statements to be used in the PSF Startup Proc:

FAILURE – Specifies the action PFS/MVS to take after a printing failure or a TCP/IP network failure. If FAILURE=WCONNECT and the printer is connected to another host when PSF/MVS attempts to establish a connection on TCP/IP, PSF/MVS continuously retries (up to the limit

specified in CONNINTV) until the printer becomes available. FAILURE=STOP stops the attempt to connect the printer.

TIMEOUT – Specifies the action that PSF/MVS takes after a timeout when on output is available on JES. The DISCINTV parameter specifies the timeout interval. TIMEOUT=REDRIVE requests that PSF/MVS redrive the printer FSA using the value of the MGMTMODE parameter. TIMEOUT=STOP requests that PSF/MSV stop the printer FSA, which can then be restarted only by an operator command.

MGMTMODE – Set this parameter to OUTAVAIL. OUTAVAIL requests that PSF start a communications session with the printer only when output is available on the JES spool.

DISCINTV – Specifies the disconnect interval in seconds. The value can range from zero to 86,400. It is suggested that the setting be 15. When no output is available from JES for this time period, PSF/MSV ends the session with the printer. If the value is set to zero, PSF/MSV does not end the session because there is no output.

IPADDR – Specifies the IP address of the printer. Replace the xxx.xxx.xxx.xxx with the IP address of the printer's Ethernet connection.

PORTNO – Specifies the TCP/IP socket that is used for AFP/IPDS printing. This parameter must be 9100.

For more information on the PRINTDEV statement, see the IBM publication PSF/MSV System Programming Guide.

Using the Laser Printer with IPDS

In normal operation, a session with the printer is maintained while there is output on the JES spool and the printer is available. When there is no more output on the spool and the disconnect interval expires, PSF/MVS ends the session with the printer. PSF/MVS attempts to restart the session when there is more work on the spool for the printer. After the session is restarted, PSF/MVS must reload the resources required for the print jobs.

To use a laser printer with IPDS with your MVS system, you use the following JES operator commands

Starting a Laser Printer with IPDS

To start the printer on MVS, do the following:

1. Start TCP/IP.

2. Power on the printer. 3. Start the printer FSA.

    - For JES2:
      $Sprinter-name

    - For JES3:
      VARY printer-name, ON

Stopping a Laser Printer with IPDS

You can stop the printer on MVS in the following ways:

The preferred method is to first stop the PSF FSA for the printer by entering the following command from the MVS console:

- For JES2:
  $Printer-name

- For JES3:
  VARY printer-name, OFF

  CANCEL printer-name where printer-name specifies the name of the printer FSA. The printer can then be turned off.

- To end the PSF FSA for the printer, use the JES commands. If you are unable to purge or cancel the printer using the JES commands, enter the following command:

  MODIFY FFSname, FORCE, printer-name

eServer i5, iSeries or AS/400 Configuration

The basic configuration of the printer's Ethernet connection should already have been completed for TCP/IP Printing. The printer's IP address is found on the printer's configuration page. If you cannot find it, contact your System Administrator. Configuration options for IPDS can be set through either the printer's front panel, the printer's Web page, or by using host download commands. These functions are described later in this chapter.

Several steps are required to configure the IBM host system to enable IPDS printing to a laser printer with IPDS installed. These include ensuring that PSF/400 is installed, that your eServer i5, iSeries or AS/400 has the required PTF's installed and configured properly to support TCP/IP printing, verifying that line descriptions and host TCP/IP table entries are made, configuring printer devices for use with PSF/400, and configuring the data area that is used by AFP.

Requirements

Make sure that the eServer i5, iSeries or AS/400 host is running a version of OS/400 that supports TCP/IP, has PSF/400 installed, and that you have the most recent PTF's installed and configured.

The PTF information presented below may have been superseded with more recent releases. For versions not shown below, check with IBM for the appropriate PTF information. Additional information about PTF's to use can be obtained from IBM's eServer i5, iSeries or AS/400 service Web site. http://as400service.rochester.ibm.com

OS/400 V3R1	
General	C6198310 Cumulative tape or later SF35164 TCP/IP for PSF/400 (order cover letter only) SF24140 IPDS pass through (order cover letter only)
Sockets	SF30018
WRKAFP2	SF40039
PSF/400	APAR SA44304

OS/400 V3R2	
PSF/400	APAR SA44304

OS/400 V3R6	
General	C5346360 Cumulative tape or later SF45620 TCP/IP for PSF/400 (order cover letter only)

	SF45624 IPDS pass through
Sockets	SF30508
WRKAFP2	SF31461
PSF/400	APAR SA44304
OS/400 V3R7	
PSF/400	APAR SA44304

Creating a Line Description on the eServer i5, iSeries or AS/400

If the laser printer with IPDS and the eServer i5, iSeries or AS/400 host are not on the same LAN segment, have the system administrator verify that there is a route defined in the TCP/IP route List. If there is not a route defined, use the eServer i5, iSeries or AS/400 **ADDTCPRTE** COMMAND to create a route definition.

Also, verify if a line description has been created for the line to which the laser printer with IPDS will be attached. If there is not a line description, have the system administrator use the eServer i5, iSeries or AS/400 **CRTLINETH** to create an Ethernet line description.

Configuring a TCP/IP Host Table Entry

This step is optional – IBM suggests that a host entry may be created in the TCP/IP table. Have the system administrator use the eServer i5, iSeries or AS/400 **CFGTCP** command to add the host name and TCP/IP address of the printer's Ethernet connection.

Configuring V3R1 or V3R6

PSF/400 for V3R1 or V3R6

The following instructions are used to create a printer device description:

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTDEVPRT**.

2. Press the F11 key to display the keywords.

3. In the "Device Description" (**DEVD**) field, enter the name of the printer. The name may comprise of the letters A-Z and numerals 0-9. It must begin with a letter, and a maximum of 10 characters is allowed.

4. In the “Device Class” (**DEVCLS**) field, enter ***RMT.**

5. In the “Device Type” (**TYPE**) field, enter ***IPDS**.

6. In the “Device Model” (**MODEL**) field, enter **0**.

7. In the “Advanced Function Printing” (**AFP**) field, enter ***YES**.

8. In the “AFP Attachment” (**AFPATTACH**) field, enter ***APPC**.

9. In the “Font” (**FONT**) field, enter an appropriate value such as **11**.

10. In the “Form Feed” (**FORMFEED**) field, enter ***AUTOCUT**.

11. In the “Remote Location” (**RMTLOCNAME**) field, enter **TCPIP**.

AFP for V3R1 or V3R6

The following instructions are used to create a data area that is used by PSF/400:

1. At the eServer i5, iSeries or AS/400 command line, enter the command **WRKAFP2**.

2. Press the F11 key to display the keywords, then press F10 to display additional values.

3. In the “Printer Device Name (**DEVD**) field, enter the name of the printer. This name must be identical to the name entered for the device name in the DEVD field in the CRTDEVPRT command.

4. In the “IPDS Pass Through” (**IPDSPASTHR**) field, enter ***NO**.

   You may to set this value to *YES if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM’s Printer Device Programming Version 5 (SC41-5713-05) publication.

5. In the “TCP/IP Support” (**TCPIP**) field, enter ***YES**.

6. In the “Remote System” (**RMTSYS**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

7. In the “Port” (**PORT**) field, enter **9100**.

8. In the “Activation Timer” (**ACTTMR**) field, enter ***NOMAX**. This will cause PSF/400 to wait indefinitely for a response to an activation request.

9. In the “Inactivity Timer” (**INACTTMR**) field for V3R1, or “Release Timer” (**RLSTMR**) field for V3R6, enter ***SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the IPDS Printer while there are no spooled files with a status of RDY.

Configuring V3R2

PSF/400 for V3R2

The following instructions are used to create a printer device description:

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTDEVPRT**.

2. Press the F11 key to display the keywords.

3. In the “Device Description” (**DEVD**) field, enter the name of the laser printer with IPDS. The name may comprise of the letters AZ and numerals 0-9. It must begin with a letter, and a maximum of 10 characters is allowed.

4. In the “Device Class” (**DEVCLS**) field, enter ***RMT**.

5. In the “Device Type” (**TYPE**) field, enter ***IPDS**.

6. In the “Device Model” (**MODEL**) field, enter **0**.

7. In the “Advanced Function Printing” (**AFP**) field, enter ***YES**.

8. In the “AFP Attachment” (**AFPATTACH**) field, enter ***APPC**.

9. In the “Font” (**FONT**) field, enter an appropriate value such as **11**.

10. In the “Form Feed” (**FORMFEED**) field, enter ***AUTOCUT**.

11. In the “Remote Location” (**RMTLOCNAME**) field, enter **TCPIP**.

AFP for V3R2

The following instructions are used to create a data area that is used by PSF/400:

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTPSFCFG**.

2. Press F11 to display the keywords, then press F10 to display additional values.

3. In the “PSF Configuration” (**PSFCFG**) field, enter the name of the printer.

4. In the “Library” field, enter **QGPL**.

5. In the “IPDS Pass Through” (**IPDSPASTHR**) field, ***NO**.

   You may to set this value to *YES if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM’s Printer Device Programming Version 5 (SC41-5713-05) publication.

6. In the “Activation Release Timer” (**ACTRLSTMR**) field, enter ***NORDYF**. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session (which does not terminate the writer).

7. In the “Release Timer” (**RLSTMR**) field, enter ***SEC15**. This parameter should be set to a value less than the timeout value on the

printer. This is the time PSF/400 will maintain a session with the printer while there are no spooled files with a status of RDY.

8. In the "Remote Location Name or Address" (**RMTLOCNAME**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

9. In the "Port" (**PORT**) field, enter **9100**.

10. In the "TCP/IP Activation Timer" (**ACTTMR**) field, enter ***NOMAX**. This will cause PSF/400 to wait indefinitely for a response to an activation request.

Configuring V3R7 or V4R1

AFP for V3R7 or V4R1

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTPSFCFG**.

2. Press Enter or F4 to display the keywords.

3. In the "PSF Configuration" (**PSFCFG**) field, enter the name of the printer. Remember this name as it will also be entered in the User-Defined Object (USRDFNOBJ) field in the printer device description that will be created in the next section.

4. In the "IPDS Pass Through" (**IPDSPASTHR**) field, enter ***NO**.

   You may to set this value to *YES if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM's Printer Device Programming Version 5 (SC41-5713-05) publication.

5. In the "Activation Release Timer" (**ACTRLSTMR**) field, enter ***NORDYF**. This will cause PSF/400 to print all spooled files with a

status of RDY before releasing the session (which does not terminate the writer).

6. In the “Release Timer” (**RLSTMR**) field, enter ***SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the printer while there are no spooled files with a status of RDY.

PSF/400 for V3R7 or V4R1

The following instructions are used to create a printer device description:

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTDEVPRT**.
2. Press the F4 key to display the keywords.
3. In the “Device Description” (**DEVD**) field, enter the name of the printer. The name may comprise of the letters A-Z and numerals 0-9, must begin with a letter, with a maximum of 10 characters allowed.
4. In the “Device Class” (**DEVCLS**) field, enter ***LAN**.
5. In the “Device Type” (**TYPE**) field, enter ***IPDS**.
6. In the “Device Model” (**MODEL**) field, enter **0**.
7. In the “LAN Attachment” (**LANATTACH**) field, enter ***IP**. Then press F10.
8. In the “Advanced Function Printing” field, enter ***YES**.
9. In the “Port Number (**PORT**) field, enter **9100**.
10. In the “Font” (**FONT**) field, enter an appropriate value such as **11**.
11. In the “Form Feed” (**FORMFEED**) field, enter ***AUTOCUT**.
12. In the “Activation Timer” (**ACTTMR**) field, enter ***NOMAX**. This will cause the eServer i5, iSeries or AS/400 host to wait indefinitely for a response to an activation request.

13. In the “Remote Location” (**RMTLOCNAME**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

14. In the “User-Defined Object” (**USRDFNOBJ**) field enter the printer name that you entered in the PSF Configuration (PSFCFG) field when setting up AFP (section 3.1.6.1, step 3 above). This is the PSF configuration object that is used internally by the eServer i5, iSeries or AS/400 when referring the IPDS Printer Emulation.

    Leave the “Library” blank unless you know its name.

    Enter ***PSFCFG** as the “Object Type”.

Configuring V4R2 and Above

AFP for V4R2 and Above

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTPSFCFG**.

2. Press Enter or F4 to display the keywords.

3. In the “PSF Configuration” (**PSFCFG**) field, enter the name of the printer. Remember this name as it will also be entered in the User-Defined Object (USRDFNOBJ) field in the printer device description that will be created in the next section.

4. In the “IPDS Pass Through” (**IPDSPASTHR**) field, enter ***NO**.

    You may to set this value to *YES if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM’s *Printer Device Programming Version 5* (SC41-5713-05) publication.

5. In the "Activation Release Timer" (**ACTRLSTMR**) field, enter ***NORDYF**. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session (which does not terminate the writer).

6. In the "Release Timer" (**RLSTMR**) field, enter ***SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the printer while there are no spooled files with a status of RDY.

7. In the "**Automatic Session Recovery**" field, enter ***YES**. This causes the PSF/400 to automatically attempt to resume printing when a session has been unexpectedly ended.

8. In the "**Acknowledgement Frequency**" field, enter "**10**". This value is the frequency, in number of pages, that the eServer i5, iSeries or AS/400 sends an acknowledgement request to the printer for status of pages printed. This value is used to determine where to restart printing after a connection has been lost and re-established. However, if acknowledgement frequency requests are made with great frequency, such as once per page, a performance degradation may be noticed.

9. Optional selection – In the "Page Size Control" field, enter *YES. This causes PSF/400 to set the page size (forms) in lieu of using the printer's default size. Generally this parameter is used when a 4028 printer emulation is selected.

10. Optional Selection – In the "Edge Orien", enter *YES. When the page rotation value of a spooled file is *COR or *AUTO and the system rotates the output, 90 degree rotation is normally used. When this parameter is *Yes, PSF/400 rotates the output 270 degrees instead of 90 degrees.

PSF/400 for V4R2 and Above

The following instructions are used to create a printer device description:

1. At the eServer i5, iSeries or AS/400 command line, enter the command **CRTDEVPRT**.

2. Press the F4 key to display the keywords.

3. In the “Device Description” (**DEVD**) field, enter the name of the printer. The name may comprise of the letters A-Z and numerals 0-9, must begin with a letter, with a maximum of 10 characters allowed.

4. In the “Device Class” (**DEVCLS**) field, enter ***LAN**.

5. In the “Device Type” (**TYPE**) field, enter ***IPDS**.

6. In the “Device Model” (**MODEL**) field, enter **0**.

7. In the “LAN Attachment” (**LANATTACH**) field, enter ***IP**. Then press F10.

8. In the “Advanced Function Printing” field, enter ***YES**.

9. In the “Port Number (**PORT**) field, enter **9100**.

10. In the “Font” (**FONT**) field, enter an appropriate value such as **11**.

11. In the “Form Feed” (**FORMFEED**) field, enter ***AUTOCUT**.

12. In the “Activation Timer” (**ACTTMR**) field, enter ***NOMAX**. This will cause the eServer i5, iSeries or AS/400 host to wait indefinitely for a response to an activation request.

13. In the “Remote Location” (**RMTLOCNAME**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.

14. In the “User-Defined Object” (**USRDFNOBJ**) field, enter the printer name that you entered in the PSF Configuration (PSFCFG) field when setting up AFP (section 3.1.7.1, step 3 above). This is the PSF configuration object that is used internally by the eServer i5, iSeries or AS/400 when referring the IPDS Printer Emulation.

    Leave the “Library” blank unless you know its name.

    Enter *PSFCFG as the “Object Type”.

Verifying the IPDS Configuration on the eServer i5, iSeries or AS/400

To test that the eServer i5, iSeries or AS/400 and the printer are connected and communicating, ping the printer from an eServer i5, iSeries or AS/400 workstation with the following command:

PING 'TCP/IP ADDRESS' or PING HOST NAME

'TCP/IP Address' is the address of the printer (be sure to include the single quote marks around the address). Host name is the optional name you may have defined for the printer if you created an optional TCP/IP Host Table entry. If the pings are successful, vary on the printer's device description by typing this command (all on one line):

VRYCFG(printer device name)
CFGTYPE(*DEV) STATUS(*ON)

To use PSF/400 to send IPDS files to the printer, start the writer by typing this command:

STRPRTWTR DEV(printer device name)

Chapter 9: Configuring IPDS on the MHP Printer

You can change many configuration parameters that affect IPDS printing through the use of the printer's front panel. On newer LaserJet printers, you may also use the printer's Web interface to access the IPDS configuration parameters. In addition, the Host Download Command scripting can also be used.

Front Panel Configuration

After installation of the IPDS, additional selections become accessible on the printer's front panel. Through the printer's front panel you can select and control such functions as the type of IPDS emulation, page setup features such as text compression, paper handling support, initiating trouble shooting features such as EDCDIC and ASCII dumps, etc.

To configure IPDS via the front panel, press the main menu button until you reach the sections to configure IPDS. There can be as many as three menu different options for IPDS. These may vary depending upon the LaserJet model. Prior to changing any options via the front panel, it is recommended that you print a Menu Map. The Menu Map shows all menu settings, including the sections for IPDS and the current settings.

After you reach any of the IPDS setup menus, you may step through the different settings by using the "item" button. Individual selections within each menu item can be addressed with the "value" button. Active menu selections are noted by an asterisk (*). To select a different setting than the active one, use the value button until your desired option is displayed and save it using the "select" button.

After all front panel options have been selected, it is recommended that you print a copy of the Menu Map of all front panel settings. This shows all front panel settings (for every front panel option, not just the IPDS).

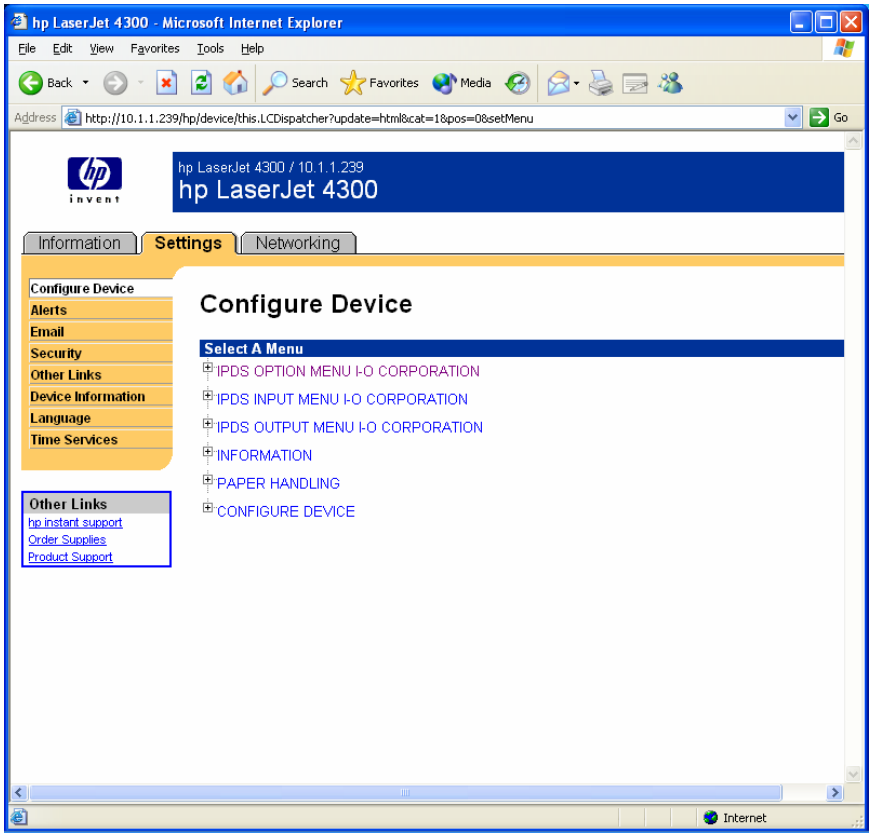
Web Page Configuration

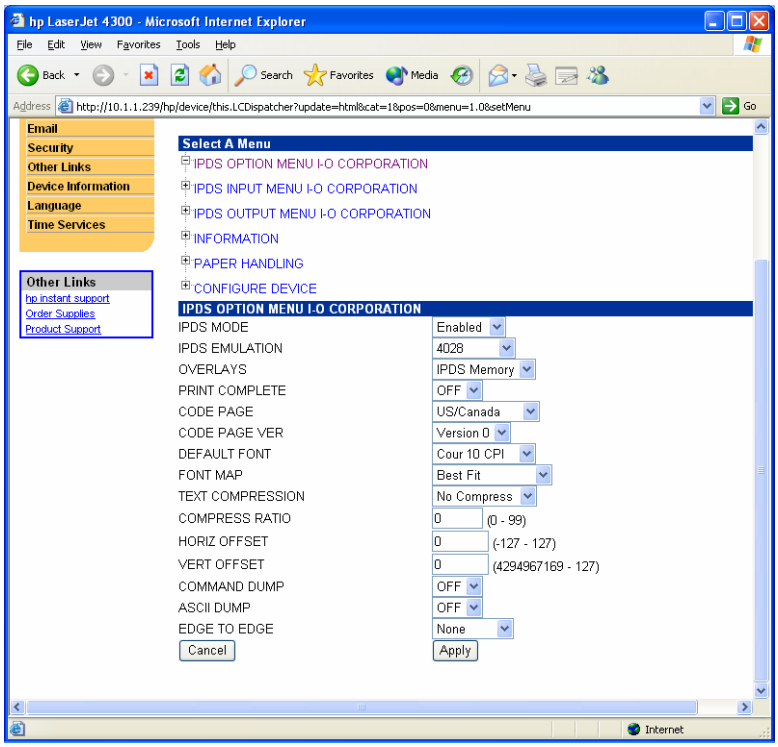
To configure the IPDS via the printer's internal Web server, using the Web browser on a PC navigate to the printer's URL (the printer's IP address). Generally you will find the IPDS menus under the Settings

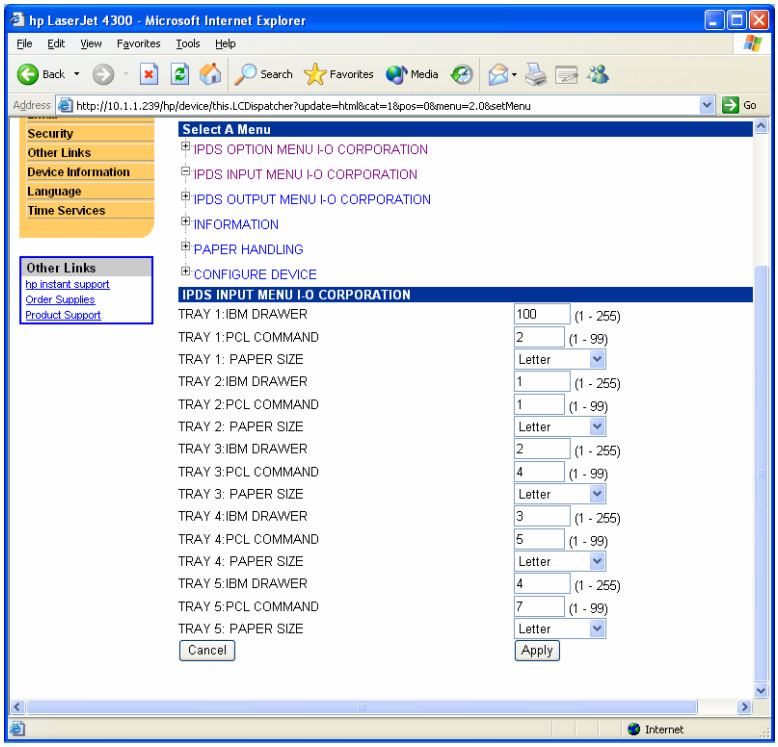
section. However, because the Web pages differ from printer model to printer model, you may need to search around on the printer's Web pages until you locate the area where all the printer's menus are displayed. You can then customize the IPDS conversion values right on the PC's screen. Since not all LaserJet printers are capable of providing a Web page, this method of configuration may not be available. Printers that do not support the Web page configuration option include the LaserJet 4050, 8000, 8100, 8150, 4100, 4100MFP, 9000 and 9000MFP.

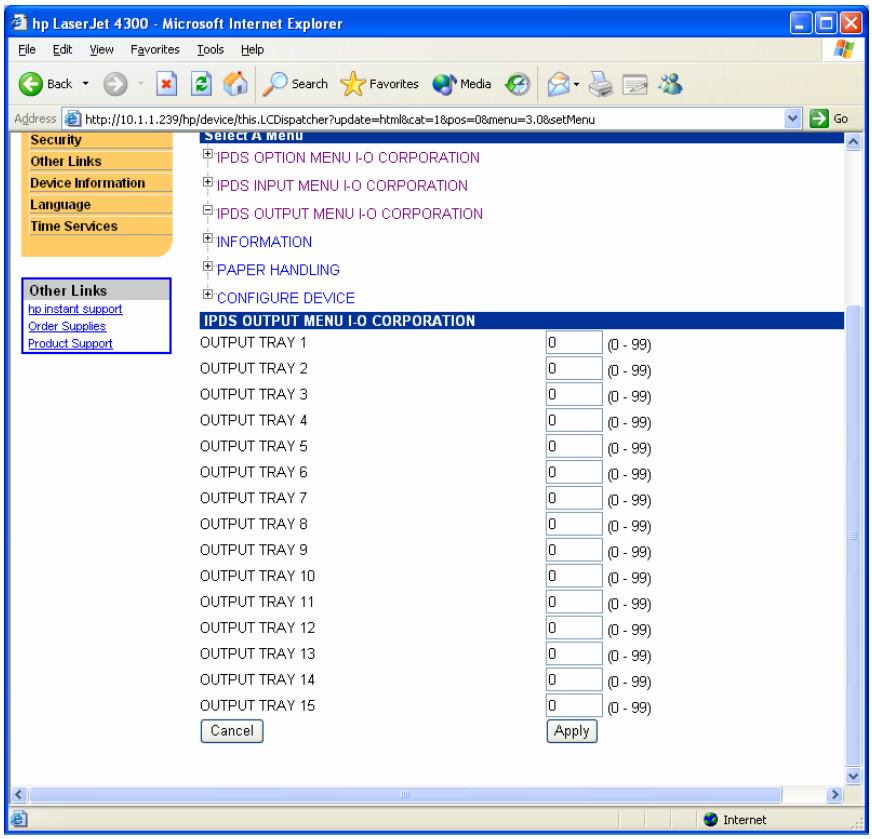
After all menu options have been selected, it is recommended that you print a copy of the Menu Map of all printer's settings. This shows all of the printer's options including the IPDS configuration settings.

The following are samples of the Web pages for the HP 4300 LaserJet.




hp LaserJet 4300 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://10.1.1.239/hp/device/this.LCDispatcher?update=html&cat=1&pos=0&menu=1.0&setMenu
Go
Email
Security
Other Links
Device Information
Language
Time Services
Other Links
hp instant support
Order Supplies
Product Support
Select A Menu
IPDS OPTION MENU I-O CORPORATION
IPDS INPUT MENU I-O CORPORATION
IPDS OUTPUT MENU I-O CORPORATION
INFORMATION
PAPER HANDLING
CONFIGURE DEVICE
IPDS OPTION MENU I-O CORPORATION
IPDS MODE Enabled
IPDS EMULATION 4028
OVERLAYS IPDS Memory
PRINT COMPLETE OFF
CODE PAGE US/Canada
CODE PAGE VER Version 0
DEFAULT FONT Cour 10 CPI
FONT MAP Best Fit
TEXT COMPRESSION No Compress
COMPRESS RATIO 0 (0 - 99)
HORIZ OFFSET 0 (-127 - 127)
VERT OFFSET 0 (4294967169 - 127)
COMMAND DUMP OFF
ASCII DUMP OFF
EDGE TO EDGE None
Cancel
Apply
Internet


hp LaserJet 4300 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://10.1.1.239/hp/device/this.LCDispatcher?update=html&cat=1&pos=0&menu=2.0&setMenu
Go
Security
Other Links
Device Information
Language
Time Services
Other Links
hp instant support
Order Supplies
Product Support
Select A Menu
IPDS OPTION MENU I-O CORPORATION
IPDS INPUT MENU I-O CORPORATION
IPDS OUTPUT MENU I-O CORPORATION
INFORMATION
PAPER HANDLING
CONFIGURE DEVICE
IPDS INPUT MENU I-O CORPORATION
TRAY 1:IBM DRAWER 100 (1 - 255)
TRAY 1:PCL COMMAND 2 (1 - 99)
TRAY 1: PAPER SIZE Letter
TRAY 2:IBM DRAWER 1 (1 - 255)
TRAY 2:PCL COMMAND 1 (1 - 99)
TRAY 2: PAPER SIZE Letter
TRAY 3:IBM DRAWER 2 (1 - 255)
TRAY 3:PCL COMMAND 4 (1 - 99)
TRAY 3: PAPER SIZE Letter
TRAY 4:IBM DRAWER 3 (1 - 255)
TRAY 4:PCL COMMAND 5 (1 - 99)
TRAY 4: PAPER SIZE Letter
TRAY 5:IBM DRAWER 4 (1 - 255)
TRAY 5:PCL COMMAND 7 (1 - 99)
TRAY 5: PAPER SIZE Letter
Cancel
Apply
Internet


hp LaserJet 4300 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://10.1.1.239/hp/device/this.LCDispatcher?update=html&cat=1&pos=0&menu=3.0&setMenu
Go
Security
Other Links
Device Information
Language
Time Services
Other Links
hp instant support
Order Supplies
Product Support
Select A Menu
IPDS OPTION MENU I-O CORPORATION
IPDS INPUT MENU I-O CORPORATION
IPDS OUTPUT MENU I-O CORPORATION
INFORMATION
PAPER HANDLING
CONFIGURE DEVICE
IPDS OUTPUT MENU I-O CORPORATION
OUTPUT TRAY 1 0 (0 - 99)
OUTPUT TRAY 2 0 (0 - 99)
OUTPUT TRAY 3 0 (0 - 99)
OUTPUT TRAY 4 0 (0 - 99)
OUTPUT TRAY 5 0 (0 - 99)
OUTPUT TRAY 6 0 (0 - 99)
OUTPUT TRAY 7 0 (0 - 99)
OUTPUT TRAY 8 0 (0 - 99)
OUTPUT TRAY 9 0 (0 - 99)
OUTPUT TRAY 10 0 (0 - 99)
OUTPUT TRAY 11 0 (0 - 99)
OUTPUT TRAY 12 0 (0 - 99)
OUTPUT TRAY 13 0 (0 - 99)
OUTPUT TRAY 14 0 (0 - 99)
OUTPUT TRAY 15 0 (0 - 99)
Cancel
Apply
Internet

Host Download Commands

By sending download commands from the IBM host to the IPDS, you can change some of the configuration parameters.

Host download commands are placed in a host document or on the screen. When the print job or screen print is sent to the printer, the download command is recognized as a configuration command. The configuration values are changed. Then the remainder of the print is processed. The command itself will not be printed if it was entered correctly. If any part of the command is printed, the IPDS did not recognize the command because of a problem in the format. Check the syntax of the command and send the command again.

Most host download commands sent to the IPDS Printer Emulation take effect immediately but stay only in the printer's active memory. To save the changed configuration beyond a power OFF, host download command &%I99,0 must be sent.

Take the following steps to enter a host download command.

1. Type the Command Pass-Thru delimiter &% in the document at the point where the command is to take effect.

2. Type an upper case "I".

3. Type the command number for the configuration option to be used (see the configuration options in the next section). Always use two digits for the command number (i.e. &%I05,)

4. Type a comma.

5. Type the value representing the desired selection. No spaces are allowed. A space or invalid character in a command causes the IPDS to ignore the command and resume printing from the point the error occurred.

6. A space or control character (i.e., NL, FF, CR, LF) signals the end of the download command.

7. Multiple commands can be chained together by using a slash (/) or back slash (\) to separate the commands (no spaces allowed). For example, to set the Default Code Page (Command 30) to Canadian/French (Value 0260) and set the Code Page Version to version 0, type:

&%I30,0260/31,0

Not all IPDS configuration options have Host Download Commands. Refer to the configuration options in the next section for a description of each configuration option and the appropriate Host Download Command syntax when applicable.

IPDS Options

The following table lists all the IPDS configuration options in alphabetic order. Please refer to the menu map to determine which IPDS options for your specific LaserJet model are available and on which menu the options are located.

For additional instructions regarding the use of IPDS configuration options including proper syntax, refer to ***Appendix A: IPDS Advanced Features.***

Configuration Option	Value
600 DPI GRAPHICS	300*, 600
ASCII DUMP	On, Off*
CODE PAGE	0037*, See Appendix A
CODE PAGE VER	0*, 1
COMMAND DUMP	On, Off*
COMPRESS RATIO	0-99, 5*
DEFAULT FONT	Refer to ***MHP Advanced Features Guide***
EDGE-TO-EDGE	None*, Simulated
EMULATION	4028*, 3812/3816
ENVELOPE TRAY	0-99, 3*
FONT MAP	Use HDL Command #34
HORIZONTAL OFFSET	-127 to 127, 0*
INPUT TRAY MAPPING – IBM Drawer	--
INPUT TRAY MAPPING – PCL Command	--
INPUT TRAY MAPPING – Paper Size	--
INPUT TRAY 1 or 2	0 to 99, 1* or 4*
IPDS MODE	Enabled*, Disabled
MANUAL TRAY	0 to 99, 2*
OUTPUT TRAY	0 to 99, 1*
OVERLAYS	Use HDL Command #24
PRINT IPDS OPTIONS CONFIGURATION PAGE	Use HDL Command #98
RESTORE DEFAULTS	Use HDL Command #98
SAVE CURRENT SETTINGS	Use HDL Command #99
TEXT COMPRESSION	Use HDL Command #40
VERTICAL OFFSET	Use HDL Command #43

*Default value

Sample Data Files (optional)

The CD contains a set of data files. These data file can be used along with the IPDS player to demonstrate the IPDS capabilities. Here is a description of the files contained with-in the IPDS directory on the CD:

README	Instruction on how to use IPDS Player.
IPDSplayer.exe	IPDS Player executable.
Sun Seed Invoice.hex	Sample Data file.

Chapter 10: Troubleshooting

This chapter contains solutions for problems you may encounter while using the product. If a problem persists even after you implement the solutions provided here, or if you encounter a problem not listed here, please contact your dealer, or Capella Technologies Support Group by email at support@capellatech.com.

This chapter provides instructions for troubleshooting of printing problems you may encounter when operating IPDS.

Software Updates

Email Capella Technologies Support Group (support@capellatech.com) to arrange for an update.

IPDS Information

There are several ways to generate printer pages to verify the installation and configuration of the IPDS. All of the printer tests regarding the IPDS are accessed from the printer's front panel.

IPDS Information Page

Step through the printer's main menu until you see the IPDS Information section. The first option is to Print the IPDS Information Page. The page will show the current software version of IPDS.

Printer Configuration Page

From the printer's main menu, step through the menu options until you see the Information Menu. Select the option to Print Configuration. Several pages will be printed. This will show all installed options in the printer. If MHP is properly installed, you will see the reference under the "Installed Personalities and Options" section. You will also see an IPDS configuration page that will show the current software version.

Printer Menu Map

From the printer's main menu, step through the menu options until you see the Information Menu. Select the option to "Print Menu Map". The menu map will show all available options on IPDS and the current settings.

Command & ASCII Dumps

IPDS includes two different dump modes. These are helpful in diagnosing IPDS to PCL conversion problems.

Command Dump

An IPDS Command Dump can be useful to diagnosis problems with your IPDS print jobs.

The IPDS Command Dump will print a listing of IPDS commands received from the host. A description of each command received along with the command number and numeric settings is printed.

To activate the IPDS Command Dump Mode, wait until all printing is completed, then end the printer's writer at the host.

1. Step through the main menu until you come to the IPDS OPTION MENU.

2. Step through the IPDS OPTION MENU until you come to the COMMAND DUMP option.

3. Select COMMAND DUMP ON and save the option.

4. Restart the printer's writer at the host and resend the print job.

The information contained in the IPDS Command Dump, will be best interpreted with the help of Capella Technologies Support Group (support@capellatech.com).

ASCII Dump

The ASCII Dump will print a listing of PCL commands and ASCII data after the IPDS data stream has been converted by the IPDS component.

To activate the ASCII Command Dump Mode, wait until all printing is completed, then end the printer's writer at the host.

1. Step through the main menu until you come to the IDPS OPTION MENU.

2. Step through the IPDS OPTION MENU until you come to the ASCII DUMP option.

3. Select ASCII DUMP ON and save the option.

4. Restart the printer's writer at the host and resend the print job.

The information contained in the ASCII Command Dump will be best interpreted with the help of Capella Technologies Support Group (support@capellatech.com).

FormPort Flash Error Messages

When using FormPort Flash, you may encounter one or more messages displayed on the printer's front panel. It's also possible you might encounter a printed error message that is not included here.

If you are unable to resolve the problem from the printed or displayed information, then please write down the information from the Front Panel and (if possible) print a Capella Technologies Configuration Page before contacting Capella for assistance.

Printer Front Panel Errors

FPDM ERROR: 01	Couldn't Open a Spool File
FPDM ERROR: 02	Undefined Job/Form Sort String
FPDM ERROR: 03	Couldn't Allocate Memory
FPDM ERROR: 04	FSA 0 Does Not Exist
FPDM ERROR: 05	FSA 0 Not Hard Disk or Flash DIMM
FPDM ERROR: 06	FSA 0 Write Protected
FPDM ERROR: 07	Couldn't Open the Form-Triggers file
FPDM ERROR: 08	Couldn't Find a Line Number
FPDM ERROR: 09	Couldn't Find a Column Number
FPDM ERROR: 10	Couldn't Find a Form-Name String
FPDM ERROR: 11	FSA Write Error
FPDM ERROR: 12	FSA Write Error
FPDM ERROR: 13	Couldn't Open a Spool File
FPDM ERROR: 14	Requested Line-Length would Overflow Buffer
FPDM ERROR: 15	Couldn't Open FSA Spool File
FPDM ERROR: 16	Software/Hardware Problem
FPDM ERROR: 17	Incorrect Number of Entries Were Printed
FPDM ERROR: 18	There are No FSA Devices Available
FPDM ERROR: 19	There are No Usable FSA Devices
FPDM ERROR: 20	Software/Hardware Problem

FPD ERROR: 01	FSA Write Error
FPD ERROR: 02	FSA Write Error
FPD ERROR: 03	Couldn't Open a Spool File
FPD ERROR: 04	There are No FSA Devices Available
FPD ERROR: 05	There are No Usable FSA Devices
FPD ERROR: 06	Software/Hardware Problem
FPD ABORT: ##	Print Logic Engine Aborted with Error '##'

Additional FormPort Flash Printed Error Messages

If the FormPort Flash detects an Error while reading a Form then it will re-assign the Trigger Line and the Trigger Column numbers so that the Form will be unavailable for printing (any Entry that has a Line/Column number that is greater than or equal to 700 is ignored). This temporary "reassignment of numbers" does not change the Job/Form Trigger Entry that is contained in the printer's "forms.cfg" file that is used by the EWS Configuration Tool..

The cause of the Error is indicated on the FormPort Flash Configuration Page in the "Printer-Resident Form Definitions" section. The FormPort Flash re-assignment of "Trigger Line" and "Trigger Column" numbers will correspond to one of the following Errors:

***** INVALID PAGE-PARAMETER IN FORM FILE *****	
Line/Column 701	Page 1 is Too Wide
Line/Column 702	Page 1 is Too Long
Line/Column 703	Double-Byte Not Supported Here
Line/Column 704	Page 1 Width is Less Than Page n Width
Line/Column 705	Page 1 Length is Less Than Page n Length
***** BAD STRUCTURE IN FORM FILE *****	
Line/Column 801	Error Reading DOCUMENT Structure
Line/Column 802	Error Reading AS400 Structure
Line/Column 803	Error Reading PAGE Structure
Line/Column 804	Error Reading TEXT Structure
Line/Column 805	Error Reading GRAPH Structure
Line/Column 806	Error Reading IMAGE Structure
Line/Column 807	Error Reading BARCODE Structure
Line/Column 808	Error Reading TEXTFIELD Structure
Line/Column 809	Error Reading IMAGEFIELD Structure
Line/Column 810	Error Reading BARCODEFIELD Structure
Line/Column 811	Error Reading DELETESPDATA Structure
Line/Column 812	Error Reading FONT Structure
Line/Column 813	Error Reading IMAGEDATA Structure
***** BAD OR MISSING FORM FILE *****	
Line/Column 901	Error Opening Form file
Line/Column 902	Error Reading Form file
Line/Column 903	Invalid Form Header
Line/Column 904	Invalid Form Version
Line/Column 905	Error Reading Structure Header
Line/Column 906	Invalid Form Header
Line/Column 907	Unrecognized Structure
Line/Column 908	Invalid Structure Header
Line/Column 909	Couldn't Allocate Form Memory

IPDS Troubleshooting

Problem: The laser printer with the IPDS installed in it will not respond to a Ping.

Possible Resolutions: If you have problems pinging the printer:

- Verify the configuration of the eServer i5, iSeries or AS/400, including the printer's correct TCP/IP address and any intervening devices such as routers and bridges.
- Verify that the eServer i5, iSeries or AS/400 line description is varied on, the printer is turned on, and that the printer is also turned on and shows a status of READY.
- Verify that the eServer i5, iSeries or AS/400 TCP/IP interface is active.

Problem: PSF/400 terminates when initialized.

Possible Resolutions: If PSF/400 terminates when you initialize, if for IPDS printing and issues a message PQT3603, check for the following error codes:

"10" means an incorrect RMTSYS (V3R1 or V3R6) or RMTLOCNAME (V3R2, V3R7, or above) has been specified for the printer.

"15" means that PSF/400 timed out waiting for the printer's response. You should check the value you entered for Activation Timer when using WRKAFP2 (V3R1 or V3R6), CRTPSFCFG (V3R2), or CRTDEVPRT (V3R7 or above).

Codes "20-39" indicate a general communications failure. Make sure all of the components in your network are operational, such as routers.

Codes "40-59" indicate a logic error between PSF and the printer control unit. Contact IBM support.

Problem: Spooled print file remains in PND status.

Possible Resolutions:

- Check the output queue with the command WRKOUTQ OUTQ (queuename)

- This typically indicates that PSF/400 is waiting for a response from the printer. This can be verified by displaying the QSPL subsystem. WRKACTJOB SBS(QSPL). If the status of the PDJ job for the printer is SELW, then PSF/400 is waiting for a response from the printer. Make sure that the printer is online and in READY status and that all network connections (for example, routers) between the eServer i5, iSeries or AS/400 and the printer are active.

Problem: Spooled files disappear without printing.

Possible Resolutions: To resolve this problem:

- Check that the correct printer queue name and correct IP address have been used.

- Ping the IP address. If the ping is successful, disconnect the network cable from the printer, and ping the address again. If the ping is still successful, there is another printer with that IP address on the network.

Problem: Data is being clipped.

Possible Resolution:

To resolve this problem, you may want to set the PSC (Page Size Control) parameter to *YES in the WRKAFP2 (V3R1 and V3R6) command or in the CRTPSFCFG command (V3R2, V3R7 or above).

Problem: Euro symbol is not printing.

Possible Resolution: If you are not able to print the Euro symbol, check the following:

- Make certain that your printer has resident in it, the most recent version of the Windows 3.1 Latin 1 character set that contains the Euro symbol.

- Make certain that your eServer i5, iSeries or AS/400 has the latest PTFs installed that support the Euro symbol.

- Make certain that your eServer i5, iSeries or AS/400 is sending out one of the following Euro Country Extended Code Pages:

Code Page	Description
1140	USA, Canada
1141	Austria, Germany
1142	Denmark, Norway
1143	Finland, Sweden
1144	Italy
1145	Spain, Latin America
1146	UK
1147	France
1148	International

When one of these code pages is sent by the eServer i5, iSeries or AS/400, IPDS will automatically convert the eServer i5, iSeries or AS/400's Euro Country Extended Code Page into the Windows 3.1 Latin 1 (Euro version) character set and send the instruction to the laser printer to print the Euro symbol. Of course, the laser will only print the Euro symbol if the printer has the Windows 3.1 Latin 1 Euro enable character set resident in it.

Problem: My LaserJet will either not boot, or does not show IPDS on the configuration page.

Resolution: Upgrade the firmware of the printer to the most currently released version.

Make sure that the "Default Personality" setting on the font panel is set to "Auto".

Problem: IPDS shows up on the configuration page and the IPDS menu appears in the menu map printout, but there is no IPDS printing.

Resolution: Make sure that the "IPDS MODE" front panel menu option is set to active.

Make sure that the "Default Personality" setting on the front panel is set to "Auto".

Problem: IBM host pages get printed in with LAN pages.

Resolution: The LaserJet's 1/0 time out value must be set to a minimum of 15 seconds longer than the eServer i5, iSeries or AS/400's PSF "Release Timer" setting. By default, the eServer i5, iSeries or AS/400 setting is for 15 seconds. Therefore the printer's 1/0 time out value would be 30 seconds.

5250 Trouble Shooting

Problem: The eServer i5, iSeries or AS/400 assigns a 3812 printer device with a name of QPADEVnnnn (where nnnn is a 4-digit number).

Resolution: If the IBM Host Printer Name is left blank when configuring the 5250 SCS Printer Emulation session, the eServer i5, iSeries or AS/400 will create a 3812 device but will give the printer the name of QPADEVnnnn, with nnnn being a 4-digit number. However, each time the 5250 SCS Printer Emulation connects to the host, the nnnn number for the printer may be different. This may cause problems where specific printer name is used in specifying the location of printed output. It is not recommended that the eServer i5, iSeries or AS/400 be allowed to create the printer name.

Problem: The eServer i5, iSeries or AS/400 assigns a VT100 display device with a name of QPADEVnnnn (where nnnn is a 4- digit number).

Resolution: The eServer i5, iSeries or AS/400's Telnet server is not up to the most current version and does not support TN5250e printing. Install the most recent PTFs. Also make certain to have installed the most recent version of Client Access on the IBM host.

Problem: The writer is in a writing status, but no printing is occurring and there are no messages on the eServer i5, iSeries or AS/400.

Resolution: This usually occurs when communication has been lost with the host. Re-establish the session by performing the following steps:

1. End the writer.

2. Vary off the device.

3. Cycle the power on the LaserJet.

Problem: The printer device is in a Vary On pending state

Resolution: Restart the session by doing the following:

1. End the Telnet session by using the eServer i5, iSeries or AS/400's TCPADM command. (You may also use the NETSTAT command, option 3 as an alternate.)

    a. At the command line, type GO TCPADM, take selection "7" and then "3."

    b. Find the IP address for the 5250 SCS Printer Emulation session, then execute option "4 – End of Session."

    c. Cycle the power on the LaserJet.

2. If the connection status message does not indicate a successful Telnet session has been established, you may need to change the name of the IBM Host Printer Name of the 5250 SCS Printer Emulation session. This occurs because the eServer i5, iSeries or AS/400 often does not allow the original printer device name to be used until an IPL is performed at the eServer i5, iSeries or AS/400. This may also occur when the original name objects have been deleted.

Problem: The 5250 SCS Printer Emulation session loses connection with the eServer i5, iSeries or AS/400 host after a period of inactivity.

Resolution: The eServer i5, iSeries or AS/400 has a timeout value that can be set to terminate any Telnet display or printer session. Setting this value to a longer timeout will allow the 5250 SCS Printer Emulation session to remain connected for a longer period. However, this longer timeout will also allow an unattended Telnet display session to remain open for a longer period as well, and may create a security issue.

To change the Telnet inactivity timer, follow these steps:

1. Using the eServer i5, iSeries or AS/400's CFGTCP command, select menu option 20, Configure TCP/IP Applications.

2. Select menu option 11, Configure Telnet.

3. On the next screen, select menu option 12, Inactive Job Time-out.

4. Change the QINACTITV value to a longer value, or use *NONE to deactivate the inactivity timeout.

5250 SCS Connection Status Message

The 5250 SCS Printer Emulation session reports the success or failure of an attempt to communicate with the host by printing a brief connection status message on the attached printer.

The message will show whether the connection succeeded or not, the name of the host eServer i5, iSeries or AS/400 which this 5250 SCS Printer Emulation session is connected to, the host printer name, and the session status. (If there is no Host or printer name in the message it is because the host eServer i5, iSeries or AS/400 did not send that information with the status message.)

The connection status message will look somewhat like:

eServer i5, iSeries or AS/400 Host Communication Status:
Connection attempt succeeded
Host system S101256R
Printer name TNPRT00
Status code I902 - Session successfully started

The status code “I902” shown in the above example is the normal code indicating successful host communication. The possible values of the status code and suggested actions to take for that status code are as follows:

Message: 0101 — Host not responding to pings.

Solution: This message usually indicates one of the following:

- TCP/IP has not been started on the host.
- The host's IP address has not been correctly entered in the 5250 SCS Printer Emulation configuration page.
- The thin client has not been correctly connected to the LAN.

Message: 0102 — Host rejected connect to Telnet port.

Solution: The host answers pings, but rejects a TCP/IP connect attempt, probably because its Telnet server has not been started.

Message: 0111 — Host Telnet session lost.

Solution: Usually means that the printer has been varied off at the host. Also if the host has gone down, or if there is a communication (e.g. router) failure.

Message: 2777 — Damaged device description.

Solution:

Message: 8902 — Device not available.

Solution: This code appears when the 5250 SCS Printer Emulation session attempts to start a session for a printer whose name duplicates the name of a printer already active on the host. In many cases, this status code means that the thin client with an 5250 SCS Printer Emulation session has been powered-off and then powered back on within a few minutes. When the thin client with an active 5250 SCS Printer Emulation session is turned off, it takes the eServer i5, iSeries or AS/400 about 10 minutes to determine that the TCP/IP sessions for the printers are no longer active. If the 5250 SCS Printer Emulation session is restarted while the host shows the old printer sessions is still active, requests for new sessions will be rejected with this code.

You can recover by doing one of the following:

- Wait 10 minutes trying to establish another 5250 SCS Printer Emulation session.
- At the eServer i5, iSeries or AS/400, manually terminate the old TCP/IP sessions.
- Avoid the problem by allowing the 5250 SCS Printer Emulation session to end its TCP/IP connection gracefully before powering the thin client off. Do this by powering-off the attached

printer 2 minutes or more before powering closing the 5250 SCS Printer Emulation session itself

Message: 8906 — Session initiation failed.

Solution:

Message: 8907 — Session failure.

Solution:

Message: 8920 — Object partially damaged.

Solution:

Message: 8921 — Communications error.

Solution:

Message: 8922 — Negative response received.

Solution:

Message: 8925 — Creation of device failed.

Solution:

Message: 8928 — Change of device failed.

Solution:

Message: 8930 — Message queue does not exist.

Solution:

Message: 8935 — Session rejected.

Solution:

Message: 8940 — Automatic configuration failed or not allowed.

Solution:

Message: E001 — No Telnet printer support at host.

Solution: The operating system on the eServer i5, iSeries or AS/400 supports only display (not printer) devices in Telnet sessions. Update your eServer i5, iSeries or AS/400 to support TN5250e printer sessions.

Message: I902 — Session successfully started.

Solution:

Message: I904 — Source system at incompatible release.

Solution:

3270 SCS Connection Status Messages

The 3270 SCS Printer Emulation session reports the success or failure of an attempt to communicate with the host by printing a brief connection status message on the printer. The connection status message will look somewhat like:

TN3270 Host Connection Status
Connection attempt succeeded
Host address 128.03.254
Printer name TNETPRT2
Status code I002-Session successfully started

The message will show whether the connection succeeded or not, the IP address of the host computer to which the 3270 SCS Printer Emulation session is connected, the host printer name, and the session status.

The status code (I002) shown in the above example is the normal code indicating successful host communication. Possible values of the status code and suggested actions to take for each of those values are as follows:

Message: 0102 — Host rejected connect to Telnet port.

Solution: This code simply means that the print server's attempt to start a Telnet session with the host failed. This message usually indicates one of the following:

- The host is down.
- No Telnet server is active on the host.

- Communication hardware (e.g. router) required for this connection is down.
- The host's IP address is incorrectly configured on the SCS Printer Emulation setup page.
- The LaserJet has not been correctly connected to the LAN

Message: 0111 — Host Telnet session lost

Solution: Usually means that the printer has been stopped on the host. Also appears if the host goes down or if there is a communication (e.g. router) failure while a Telnet session with the host is active.

Message: E001 — No Telnet printer support at host

Solution: The operating system on the host computer supports only display (not printer) devices in Telnet sessions. Verify your operating system is at a release level that includes support for printing via Telnet sessions.

Message: E003 — TN3270 session negotiation failed

Solution: Usually means that there is no printer defined on the host with the printer name that appears in the connection status message. This code will also appear if there is a printer with the desired name, but that printer is already active and therefore not available for use over this new connection. Verify that a printer with the desired name is defined on the host, and that the printer is available for use by this print server.

Message: I002 — Session successfully started.

Solution: The printer session is ready for print jobs.

Appendix A: IPDS Advanced Features

The following is a listing of all the IPDS configuration options in alphabetic order. Please refer to the menu map to determine which IPDS options for your specific LaserJet model are available and what menu the options are located on.

The asterisks (*) by a value indicates the factory default setting.

600 DPI GRAPHICS

Determines if 600 dpi graphics are passed on to the printer at 600 dpi or converted to 300 dpi. Most graphics will print properly at 300, but some high resolution graphics require 600 dpi. However, selecting the 600 dpi option will increase the amount of time to print a document as nearly eight times more information must be downloaded to the printer.

VALUE	DESCRIPTION
Convert to 300*	Causes the graphics to be converted and printed at 300 dpi
Use 600 dpi	Causes the graphics to be printed at 600 dpi

ASCII DUMP

Enables or disables the ASCII dump feature.

VALUE	DESCRIPTION
Off*	Disables the ASCII dump feature
On	Enables the ASCII dump feature

CODE PAGE

This menu option lets you select the default Code Page for the translation tables.

This option can also be set by using Host Download Command #30.

VALUE	HDL	DESCRIPTION
US/Canada*	0037*	US/Canada Code Page
International	0500	International Code Page
Aust/German	0273	Austrian/German Code Page
Belgian	0274	Belgian Code Page
Brazilian	0275	Brazilian Code Page
Canada/Fren	0260	French Canadian Code Page
Danish/Norw	0277	Danish/Norwegian Code Page
Finn/Swedish	0278	Finnish/Swedish Code Page
French	0297	French Code Page
Italian	0280	Italian Code Page
Japan (Eng)	0281	English Character Japanese Code Page
Japanese	0290	Katakana Japanese Code Page
Portuguese	0282	Portuguese Code Page
Spanish	0289	Spanish Code Page
Span-Speaking	0284	Spanish Speaking Code Page
English (UK)	0285	English UK Code Page
Aus/Ger Alt.	0286	Alternate Austrian/German Code Page
Dan/Nor Alt.	0287	Alternate Danish/Norwegian Code Page
Fin/Swe Alt.	0288	Alternate Finish/Swedish Code Page

Host Download Command syntax:

&%I30,284 – sets the default code page to Spanish Speaking

CODE PAGE VER

Selects which code page version will be used if more than one is available.

This option can also be set by using Host Download Command #31.

VALUE	HDL	DESCRIPTION
0*	0*	Version 0
1	1	Version 1

Host Download Command syntax:

&%I31,1 – selects version 1

COMMAND DUMP

Enables or disables the command dump feature - consult Chapter 4, Troubleshooting, for further instructions on the Command Dump feature.

VALUE	DESCRIPTION
Off*	Disables the command dump feature
On	Enables the command dump feature

COMPRESS RATIO

Determines the percentage of compression of host text data to fit the logical page into the printable area of the physical page. This setting takes effect only if the front panel setting TEXT COMPRESSION is set to LPI Compress or LPI/CPI Comp.

This option can also be set by using Host Download Command #41.

VALUE	HDL	DESCRIPTION
0 to 99	0 - 99	0 to 99% Compression
5*	05*	5% (default)

Host Download Command syntax:

&%I41,50 – instructs IPDS to compress all text data by 50%.

DEFAULT FONT

Selects which font will be loaded/mapped by the printer when the host requests the "default font". Only certain fonts are selectable from the front panel. A more complete listing of default font options are selectable from the host download option. Refer to ***Chapter 4: ¬Q 5250 Font References*** in the ***MHP Advanced Features Guide*** for a listing of the fonts and their associated FGID numbers.

This option can also be set by using Host Download Command #32.

VALUE	HDL	DESCRIPTION
Cour 10 CPI		Courier 10 CPI
Cour 12 CPI		Courier 12 CPI
Cour 15 CPI		Courier 15 CPI
Cour 17.1 CPI		Courier 17.1 CPI
	XXXXX	The FGID number of the desired font (refer to the ***MHP Advanced Features Guide***)

Host Download Command syntax:

&%I32,00019 – selects OCR-A (FGID#00019) to be the default font.

EDGE-TO-EDGE

Some printers have the capability of printing from one edge of the paper to the other edge. Non edge-to-edge printers have an unprintable area around the entire page. The printable area of an edge-to-edge printer is essentially the same as the page size. For a non edge-to-edge printer, the printable area is smaller than the page. For example, an HP 4050 printer has a printable area of 8" x 10.5" on a 8.5" x 11" page, while an HP 9000 (in edge to edge mode) has a printable area that is almost as large as the page (the 9000 can print to within 1.5 mm of the edge of the page).

When a document that is designed to use the full page is printed on a non edge-to-edge printer, the document may not print correctly, i.e. the document may not be aligned correctly. There is a possibility that text on the right, top and bottom edges of the page will be cut off or overprinted. Choosing this edge-to-edge option when using a non edge-to-edge printer

may help improve the alignment. Using horizontal and vertical offsets may also improve the alignment of the document.

VALUE	DESCRIPTION
None*	No edge-to-edge adjustments are applied to the print job
Simulated	Causes adjustments to be made that will simulate edge-to-edge printing

If the printer is has edge-to-edge capability such as the HP 9000 LaserJet, setting the printer's front panel option (not the IPDS edge-to-edge option) will cause IPDS to automatically set itself to "true" edge-to-edge processing.

EMULATION

This purpose of this setting is to ensure the proper conversion of the native IBM printer DPI to the Hewlett-Packard printer. The IBM 4028 page printer is a 300 DPI printer and the 3812/3816 page printers are 240 DPI printers.

VALUE	DESCRIPTION
4028*	download fonts to printer with no change
3812/3816	Converts any 240 DPI download fonts to 300 DPI

ENVELOPE TRAY

Selects the PCL input command to be sent to the printer when the host command for the envelope tray is selected. This option is necessary since printer models and host applications may have different input trays specified. Consult the printer's manual for the input tray assignments.

VALUE	DESCRIPTION
0 to 99	PCL input tray from 0 to 99 (most printers use 1 to 4)
3*	Selects PCL input tray 3

FONT MAP

Selects how IPDS font commands from the host are mapped to printer resident PCL fonts. Refer to ***Appendix B: IPDS Fonts*** for a detailed list of font mappings. "Best Fit" maps the IPDS font to a printer resident font that most closely resembles the original IPDS font. "4028/43XX Compatible" maps the IPDS font like an IBM 4028/43XX series printer would (i.e. including font substitutions). "3812/16 Compatible" maps the IPDS font like an IBM 3812/16 printer would.

This option can also be set by using Host Download Command #34.

VALUE	HDL	DESCRIPTION
Best Fit	0	Selects the Best Fit option
4028/43XX Comp*	1*	Selects the 4028/43XX Compatible option
3812/3816 Comp	2	Selects the 3812/3816 Compatible option

Host Download Command syntax:

&%I34,2 – selects the 240 dpi 3812/16 font mapping

HORIZONTAL OFFSET

Selects the horizontal offset of the logical page on the physical page in 1/60 of an inch. If parts of the logical page containing data are moved off the physical page, this data will not print!

The default values of the HORIZONTAL OFFSET and the VERTICAL OFFSET commands align the logical page with the top left-hand corner of the physical page. Since the host printers have a non-printable area of approx. / inch around the outside of the page, host data within the / inch area would be lost. To remedy this, adjust the margin offsets the value 15 (15/60 = /).

This option can also be set by using Host Download Command #42.

VALUE	HDL	DESCRIPTION
-127 to 127	-127 to 127	-127/60 inch to 127/60 inch offset
0*	0*	no offset selected

Host Download Command syntax:

&%I42,-30 – moves the logical page 30/60 or 1/2 inch to the left

INPUT TRAY MAPPING – IBM Drawer

IPDS provides a method of mapping the IBM input drawer requests to the LaserJet's input trays. This is done by identifying the IBM input drawer ID that will be coming from the IBM host, and associating it with the PCL command number for the appropriate input tray in the printer. You will also need to identify the type of paper in each of the LaserJet's input trays.

The following chart shows the generally used IBM input drawer IDs, and their associated physical drawer descriptions:

IBM Drawer ID	IBM Printer Input Tray
1	Paper Drawer 1
2	Paper Drawer 2
65	Envelope Feed
100	Manual Feed

To associate the IBM input drawer ID with a LaserJet's physical input tray, you will need to enter the IBM input drawer ID in the IPDS IBM Drawer option. Do this for Tray1 through Tray 5.

For example, if you wanted a host print job that originally pulled paper from the IBM printer's manual feed tray to use paper in the LaserJet's manual feed tray, you would select "100" for Tray 1 IBM Command option in the LaserJet's front panel or Web page drop down menu.

INPUT TRAY MAPPING – PCL Command

After you have identified the IBM's input drawer ID for Tray 1, you will need to enter the LaserJet's PCL Command number for the physical tray you want the print jobs to be pulled from. Since the PCL Command numbers often differ between LaserJet models, refer to your printer's manual.

To associate the LaserJet's physical input tray with IBM input drawer ID, enter the PCL Command number in the IPDS PCL Command option. Do this for Tray 1 through Tray 5.

For example, if you wanted a host print job that originally pulled paper from the IBM printer's manual feed tray to use the LaserJet's manual feed tray, you would select the appropriate PCL Command (refer to the

printer's manual for the command number) for the LaserJet's manual feed tray for the Tray 1 PCL Command option in the LaserJet's front panel or Web page drop down menu. In the case of a LaserJet 9000, the PCL Command number for the manual tray would be "2".

INPUT TRAY MAPPING – Paper Size

After you have identified the IBM's input drawer ID and the associated PCL Command number for Tray 1, you will need to configure IPDS for the paper size that is in the physical input tray. This information will be sent to the IBM host along with the IBM input drawer ID to tell the host what physical trays different paper sizes can be pulled from. The available paper sizes include: letter, legal, A4, executive, ledger, A3, common number 10 envelope, monarch, C5 envelope, and DL envelope.

To associate the LaserJet's physical input tray with the paper size, select from the front panel or Web page drop down menu the paper size that is in Tray 1. Do this for Tray 1 through Tray 5.

INPUT TRAY 1 or 2

Selects the PCL input command to be sent to the printer when the host command for paper drawer 1 or 2 is selected. This option is necessary since printer models and host applications may have different input trays specified. Consult your printer's manual for the PCL input tray assignments. Most printers use PCL command number 1 for the first input tray and PCL command number 4 for the second tray. These values are the default settings for the DIMM/FLASH.

VALUE	DESCRIPTION
0 to 99	Selects PCL input tray from 0 to 99 (most printers use 1 to 4)
1* or 4*	Selects PCL input tray 1 or input tray 2

This option is only available on the 3235-010 DIMM.

IPDS MODE

In order for the IPDS component to properly operate, it must allocate certain printer resources. The purpose for this setting is to allow the user to selectively disable the use of these resources when required to do other jobs (this would have a similar effect as removing the DIMM/FLASH). In order for the MHP to print host IPDS jobs, this setting must be enabled.

VALUE	DESCRIPTION
Enabled*	Enables the IPDS conversion software of the DIMM/FLASH
Disabled	Disables the IDPS conversion software of the DIMM/FLASH

MANUAL TRAY

Selects the PCL input command to be sent to the printer when the host command for the manual tray is selected. This option is necessary since printer models and host applications may have different input trays specified. Consult the printer's manual for input tray assignments.

VALUE	DESCRIPTION
0 to 99	Selects PCL input tray from 0 to 99 (most printers use 1 to 4)
2*	Selects PCL input tray 2

This option is only available on the 3235-010 DIMM.

OUTPUT TRAY

Selects the PCL output command to be sent to the printer when the host command for an output tray is selected. This option is necessary since printer models and host applications may have different output trays specified. Consult the printer's manual for output tray assignments.

VALUE	DESCRIPTION
0 to 99	Selects PCL output tray from 0 to 99
1*	Selects PCL output tray 1

The default PCL output tray for tray 1 is 1, for tray 2 is 2… for tray 15 is 15. There are 15 output trays in this menu that you may change.

OVERLAYS

Overlays downloaded to the printer can be stored in one of two ways, temporarily in RAM or as a macro. If the overlay is stored as a macro, it will print faster but it is possible that the macro will be deleted or replaced by a print job from another host (such as Windows).

This option can also be set by using Host Download Command #24.

VALUE	HDL	DESCRIPTION
IPDS Memory*	0*	Stores the overlay in temporary memory as PCL commands
Printer Memory	1	Stores the overlay as a macro

Host Download Command syntax:

&%I24,1 – causes the overlay to be stored as a macro.

PRINT IPDS OPTIONS CONFIGURATION PAGE

Prints the current software version of the IPDS component of MHP.

This option can only be set by using Host Download Command #98.

VALUE	HDL	DESCRIPTION
Print IPDS Information Page	1	Prints the IPDS information page

Host Download Command syntax:

&%I98,1 – prints out the active setup selections.

This command is only available as a Host Download Command.

RESTORE DEFAULTS

Restores the factory default configuration selections. Also prints out a copy of the active configuration selections, or restores the most recent permanently saved configuration selections.

This option can only be set by using Host Download Command #98.

VALUE	HDL	DESCRIPTION
	0	Restores factory defaults
	1	Prints out a page showing the active configuration selections
	2	Restores most recent permanently saved configuration settings

Host Download Command syntax:

&%I98,1 – prints out the active setup selections.

This command is only available as a Host Download Command.

SAVE CURRENT SETTINGS

Saves all current settings specified through host download commands into the permanent memory of the printer.

This option can only be set by using Host Download Command #99.

VALUE	HDL	DESCRIPTION
	0	Saves all current settings

Host Download Command syntax:

&%I99,0 – saves all current settings

This command is only available as a Host Download Command.

TEXT COMPRESSION

Determines the direction of compression of host text data to fit the logical page into the printable area of the physical page. The compression ratio is set through the "COMPRESSION RATIO" front panel command.

Compressing AFP/IPDS documents containing images, graphics or bar codes in addition to text, may cause alignment problems, since only text is compressed.

This option can also be set by using Host Download Command #40.

VALUE	HDL	DESCRIPTION
No Compress*	0*	Does not compress any AFP/IPDS text
LPI Compress	1	Compresses only the LPI of the AFP/IPDS text
LPI/CPI Comp	2	Compresses both the LPI and the CPI of the AFP/IPDS text

Host Download Command syntax:

&%I40,1 – compresses all text data coming from the host vertically (LPI)

VERTICAL OFFSET

Selects the vertical offset of the logical page on the physical page in 1/60 inch increments. If parts of the logical page containing data are moved off the physical page, this data will not print.

This option can also be set by using Host Download Command #43.

VALUE	HDL	DESCRIPTION
-127 to 127	-127 to 127	-127/60 inch to 127/60 inch offset
0*	0*	no offset selected

Host Download Command syntax:

&%I43,-30 – moves the logical page 30/60 or 1/2 inch up

Appendix B: IPDS Fonts

The MHP IPDS code generally maps IPDS fonts requested from the host to PCL fonts resident in the printer. The following table shows how IPDS fonts are mapped to PCL fonts, depending on which "Font Mapping" parameter is active. When the pitch of the PCL font is not identical to the pitch of the original IPDS font, the MHP IPDS code causes the spacing between the characters to be adjusted to produce comparable print output. In some cases where the font in the printer differs drastically from that of the IBM host, the IBM font has been stored in the DIMM/FLASH. Fonts not included in this listing are downloaded form the IBM host.

IBM			Best Fit		4028/43xx Compatible		3812/16 Compatible	
FGID	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0003	**OCR B**	**10 CPI**	**Resident in MHP**					
0005	**Rhetoric**	**10 CPI**	**Letter Gothic**	**10 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**10 CPI**
0011	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0012	**Prestige Pica**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0013	**Artisian**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0018	**Courier italic**	**10 CPI**	**Courier italic**	**10 CPI**	**Courier italic**	**10 CPI**	**Courier italic**	**10 CPI**
0019	**OCR A**	**10 CPI**	**Resident in MHP**					
0020	**Pica**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0026	**Matrix Gothic**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0030	**Math Symbol**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0031	**Aviv**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0038	**Orator bold**	**10 CPI**	**Letter Gothic bold**	**10 CPI**	**Courier bold**	**10 CPI**	**Letter Gothic bold**	**10 CPI**
0039	**Gothic bold**	**10 CPI**	**Letter Gothic bold**	**12 CPI**	**Courier bold**	**10 CPI**	**Letter Gothic bold**	**12 CPI**
0040	**Gothic**	**10 CPI**	**Letter Gothic**	**12 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**12 CPI**
0041	**Roman**	**10 CPI**	**Letter Gothic**	**12 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**12 CPI**
0042	**Serif Text**	**10 CPI**	**Letter Gothic**	**12 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**12 CPI**
0043	**Serif italic**	**10 CPI**	**Letter Gothic italic**	**12 CPI**	**Courier italic**	**10 CPI**	**Letter Gothic italic**	**12 CPI**
0044	**Katakana Gothic**	**10 CPI**	**Letter Gothic**	**10 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**10 CPI**
0046	**Courier bold**	**10 CPI**	**Courier bold**	**10 CPI**	**Courier bold**	**10 CPI**	**Courier bold**	**10 CPI**
0049	**Shalom**	**10 CPI**	**Letter Gothic**	**10 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**10 CPI**
0050	**Shalom bold**	**10 CPI**	**Courier**	**10 CPI**	**Courier bold**	**10 CPI**	**Courier**	**10 CPI**
0051	**Matrix Gothic**	**10 CPI**	**Letter Gothic**	**10 CPI**	**Courier**	**10 CPI**	**Letter Gothic**	**10 CPI**

IBM			Best Fit		4028/43xx Compatible		3812/16 Compatible	
FGID	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0052	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**	**Courier**	**10 CPI**
0055	**Aviv bold**	**10 CPI**	**Courier**	**10 CPI**	**Courier bold**	**10 CPI**	**Courier bold**	**10 CPI**
0066	**Gothic**	**12 CPI**	**Letter Gothic**	**14 CPI**	**Courier**	**12 CPI**	**Letter Gothic**	**14 CPI**
0068	**Gothic italic**	**12 CPI**	**Letter Gothic italic**	**14 CPI**	**Courier italic**	**12 CPI**	**Letter Gothic italic**	**14 CPI**
0069	**Gothic bold**	**12 CPI**	**Letter Gothic bold**	**14 CPI**	**Courier bold**	**12 CPI**	**Letter Gothic bold**	**14 CPI**
0070	**Serif Text**	**12 CPI**	**Letter Gothic**	**12 CPI**	**Courier**	**12 CPI**	**Letter Gothic**	**12 CPI**
0071	**Serif italic**	**12 CPI**	**Letter Gothic italic**	**12 CPI**	**Courier italic**	**12 CPI**	**Letter Gothic italic**	**12 CPI**
0072	**Serif bold**	**12 CPI**	**Letter Gothic bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Letter Gothic bold**	**12 CPI**
0076	**APL/TN**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0080	**Math Symbol**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0084	**Script**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0085	**Courier**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0086	**Prestige Elite**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0087	**Letter Gothic**	**12 CPI**	**Resident in MHP**					
0091	**Light italic**	**12 CPI**	**Letter Gothic italic**	**12 CPI**	**Courier italic**	**12 CPI**	**Courier italic**	**12 CPI**
0092	**Courier italic**	**12 CPI**	**Courier italic**	**12 CPI**	**Courier italic**	**12 CPI**	**Courier**	**12 CPI**
0098	**Shalom**	**12 CPI**	**Letter Gothic**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0099	**Aviv**	**12CPI**	**Letter Gothic**	**12 CPI**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0101	**Shalom bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Courier bold**	**12 CPI**
0102	**Aviv bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Courier bold**	**12 CPI**
0110	**Letter Gothic bold**	**12 CPI**	**Resident in MHP**					
0111	**Prestige Elite bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Courier bold**	**12 CPI**	**Courier bold**	**12 CPI**
IBM			**Best Fit**		**4028/43xx Compatible**		**3812/16 Compatible**	
FGID	**Name**	**CPI/pt**	**PCL Font**	**CPI/pt**	**PCL Font**	**CPI/pt**	**PCL Font**	**CPI/pt**
0112	**Prestige Elite italic**	**12 CPI**	**Courier italic**	**12 CPI**	**Courier italic**	**12 CPI**	**Courier italic**	**12 CPI**
0155	**Boldface italic**	**10 Pt**	**Times New italic**	**10 Pt**	**Times New**	**11 Pt**	**Times New italic**	**10 Pt**
0158	**Modern**	**11 Pt**	**Times New**	**11 Pt**			**Times New**	**11 Pt**
0159	**Boldface**	**11 Pt**	**Times New bold**	**11 Pt**	**Times New**	**11 Pt**	**Times New bold**	**11 Pt**
0160	**Essay**	**10 Pt**	**Arial**	**11 Pt**	**Courier**	**11 Pt**	**Arial**	**11 Pt**
0162	**Essay italic**	**10 Pt**	**Arial italic**	**11 Pt**	**Courier**	**11 Pt**	**Arial italic**	**11 Pt**
0163	**Essay bold**	**10 Pt**	**Arial bold**	**11 Pt**	**Times New**	**11 Pt**	**Arial**	**11 Pt**
0164	**Prestige**	**12 Pt**	**Courier**	**12 Pt**	**Courier**	**11 Pt**	**Arial**	**11 Pt**
0167	**Barak**	**10 Pt**	**Times New**	**11 Pt**	**Courier**	**11 Pt**	**Times New**	**11 Pt**

IBM			Best Fit		4028/43xx Compatible		3812/16 Compatible	
FGID	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0168	Barak bold	10 Pt	Times New bold	11 Pt	Times New	11 Pt	Times New bold	11 Pt
0173	Essay light	10 Pt	Arial light	11 Pt	Courier	11 Pt	Courier	11 Pt
0175	Document	12 Pt	Times New	11 Pt	Courier	11 Pt	Times New	11 Pt
0178	Barak	7 Pt	Times New	7 Pt	Letter Gothic	20 CPI	Times New bold	11 Pt
0179	Barak bold	7 Pt	Times New bold	7 Pt	Letter Gothic	20 CPI	Times New bold	11 Pt
0180	Barak	9 Pt	Times New	9 Pt	Courier	15 CPI	Times New bold	11 Pt
0181	Barak bold	9 Pt	Times New bold	9 Pt	Courier	15 CPI	Times New bold	11 Pt
0182	Barak	22 Pt	Times New	22 Pt	Courier	10 CPI	Times New bold	11 Pt
0183	Barak bold	22 CPI	Times New bold	22 CPI	Courier bold	10 CPI	Times New bold	11 CPI
0204	Gothic Text	13.3CPI	Letter Gothic	13.3CPI	Courier	15 CPI	Letter Gothic	13.3CPI
0211	Shalom	15 CPI	Letter Gothic	15 CPI	Courier	15 CPI	Letter Gothic	15 CPI
0212	Shalom bold	15 CPI	Courier bold	15 CPI	Courier	15 CPI	Courier	15 CPI
0221	Prestige Elite italic	15 CPI	Gothic	15 CPI	Gothic	15 CPI	Gothic	15 CPI
0222	Gothic	15 CPI	Letter Gothic	15 CPI	Courier	15 CPI	Letter Gothic	16.7CPI
0223	Courier	15 CPI	Courier	15 CPI	Courier	15 CPI	Courier	15 CPI
0225	Math Symbol	15 CPI	Courier	12 CPI	Courier	15 CPI	Courier	12 CPI
0226	Shalom	15 CPI	Letter Gothic	15 CPI	Courier	15 CPI	Letter Gothic	16.7CPI
0229	Serif Text	15 CPI	Courier	15 CPI	Courier	15 CPI	Courier	15 CPI
0230	Gothic	15 CPI	Letter Gothic	16.7CPI	Courier	15 CPI	Letter Gothic	16.7CPI
0234	Shalom bold	15 CPI	Letter Gothic bold	16.7CPI	Courier	15 CPI	Letter Gothic bold	16.7CPI
0244	Courier	5 CPI	Courier light	8 CPI	Courier	10 CPI	Courier light	8 CPI
0245	Courier bold	5 CPI	Courier bold	8 CPI	Courier bold	10 CPI	Courier bold	8 CPI
0247	Shalom bold	17 CPI	Courier bold	17 CPI	Courier	17.1CPI	Courier bold	17 CPI
0248	Shalom	17 CPI	Courier	17 CPI	Courier	17.1CPI	Courier	17.1CPI
0252	Courier	17 CPI	Courier	14 CPI	Courier	17.1CPI	Courier	14 CPI
0253	Courier bold	17.1CPI	Courier bold	14 CPI	Courier	17.1CPI	Courier bold	14 CPI
0254	Courier	17.1CPI	Courier	17.1CPI	Courier	17.1CPI	Courier	14 CPI
0256	Prestige	17.1CPI	Courier	17.1CPI	Courier	17.1CPI	Courier	14 CPI
0281	Letter Gothic	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI
0282	Aviv	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI
0290	Letter Gothic	27 CPI	Letter Gothic	27 CPI	Letter Gothic	20 CPI	Letter Gothic	20 CPI
0416	Courier	Scalable			Courier	Scalable		
0420	Courier bold	Scalable			Courier bold	Scalable		
0424	Courier italic	Scalable			Courier italic	Scalable		
0428	Courier italic bold	Scalable			Courier italic bold	Scalable		

IBM			Best Fit		4028/43xx Compatible		3812/16 Compatible	
FGID	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
0751	**Sonoran Serif**	**8 Pt**	**CG Times**	**8 Pt**	**CG Times**	**8 Pt**	**CG Times**	**8 Pt**
IBM			**Best Fit**		**4028/43xx Compatible**		**3812/16 Compatible**	
FGID	**Name**	**CPI/pt**	**PCL Font**	**CPI/pt**	**PCL Font**	**CPI/pt**	**PCL Font**	**CPI/pt**
0752	**Naseem**	**8 Pt**	**CG Times**	**8 Pt**	**Courier**	**12 CPI**	**Letter Gothic**	**20 CPI**
0753	**Naseem bold**	**8 Pt**	**CG Times bold**	**8 Pt**	**Courier**	**12 CPI**	**Letter Gothic**	**20 CPI**
0754	**Naseem bold**	**10 Pt**	**CG Times**	**10 Pt**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0755	**Naseem bold**	**14 Pt**	**CG Times**	**14 Pt**	**Courier**	**12 CPI**	**Courier**	**10 CPI**
0756	**Naseem italic**	**8 Pt**	**CG Times italic**	**8 Pt**	**Courier**	**12 CPI**	**Letter Gothic**	**20 CPI**
0757	**Naseem italic bold**	**8 Pt**	**CG Times italic bold**	**8 Pt**	**Courier**	**12 CPI**	**Letter Gothic**	**20 CPI**
0758	**Naseem italic bold**	**10 Pt**	**CG Times italic bold**	**10 Pt**	**Courier**	**12 CPI**	**Courier**	**12 CPI**
0759	**Naseem italic bold**	**14 Pt**	**CG Times italic bold**	**14 Pt**	**Courier**	**12 CPI**	**Courier**	**10 CPI**
0760	**Times Roman**	**6 Pt**	**CG Times**	**6 Pt**	**CG Times**	**6 Pt**	**Letter Gothic**	**27 CPI**
0761	**Times Roman bold**	**12 Pt**	**CG Times bold**	**12 Pt**	**CG Times bold**	**12 Pt**	**Letter Gothic**	**20 CPI**
0762	**Times Roman bold**	**14 Pt**	**CG Times bold**	**14 Pt**	**CG Times bold**	**14 Pt**	**Letter Gothic**	**16.7CPI**
0763	**Times Roman italic**	**12 Pt**	**CG Times italic**	**12 Pt**	**CG Times italic**	**12 Pt**	**Letter Gothic**	**20 CPI**
0764	**Times Roman italic bold**	**10 Pt**	**CG Times bold italic**	**10 Pt**	**Letter Gothic**	**10 Pt**	**Letter Gothic**	**27 CPI**
0765	**Times Roman italic bold**	**12 Pt**	**CG Times bold italic**	**12 Pt**	**Letter Gothic**	**12 Pt**	**Letter Gothic**	**20 CPI**
1051	**Sonoran Serif**	**10 Pt**	**CG Times**	**10 Pt**	**CG Times**	**10 Pt**	**CG Times**	**11 Pt**
1053	**Sonoran Serif bold**	**10 Pt**	**CG Times bold**	**10 Pt**	**CG Times bold**	**10 Pt**	**CG Times bold**	**11 Pt**
1056	**Sonoran Serif italic**	**10 Pt**	**CG Times italic**	**10 Pt**	**CG Times italic**	**10.5 Pt**	**CG Times italic**	**11 Pt**
1351	**Sonoran Serif**	**12 Pt**	**CG Times**	**12 Pt**	**CG Times**	**12 Pt**	**CG Times**	**13 Pt**
1653	**Sonoran Serif bold**	**16 Pt**	**CG Times bold**	**16 Pt**	**CG Times bold**	**16 Pt**	**CG Times bold**	**16 Pt**
1803	**Sonoran Serif bold**	**18 Pt**	**CG Times bold**	**18 Pt**	**CG Times bold**	**18 Pt**	**CG Times bold**	**12 CPI**
2103	**Sonoran Serif bold**	**24 Pt**	**CG Times bold**	**24 Pt**	**CG Times bold**	**24 Pt**	**CG Times bold**	**22 Pt**
2304	**Helvetica**	**Scalable**			**Arial**	**Scalable**		
2305	**Helvetica bold**	**Scalable**			**Arial bold**	**Scalable**		
2306	**Helvetica italic**	**Scalable**			**Arial italic**	**Scalable**		
2307	**Helvetica italic bold**	**Scalable**			**Arial italic bold**	**Scalable**		
2308	**Times New Roman**	**Scalable**			**Times New**	**Scalable**		
2309	**Times New Roman bold**	**Scalable**			**Times New bold**	**Scalable**		
2310	**Times New Roman italic**	**Scalable**			**Times New italic**	**Scalable**		
2311	**Times New Roman italic bold**	**Scalable**			**Times New italic bold**	**Scalable**		
4407	**Sonoran Serif med.**	**6 Pt**	**CG Times**	**6 Pt**				
4427	**Sonoran Serif bold**	**9 Pt**	**CG Times bold**	**9 Pt**				

IBM			Best Fit		4028/43xx Compatible		3812/16 Compatible	
FGID	Name	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt	PCL Font	CPI/pt
4535	**Sonoran Serif italic**	**9 CPI**	**CG Times italic**	**9 CPI**				
4555	**Sonoran Serif italic bold**	**10 CPI**	**CG Times italic bold**	**10 CPI**				
5067	**Goudy bold italic**	**10 Pt**	**CG Times bold**	**11 Pt**	**CG Times bold**	**11 Pt**	**CG Times bold**	**11 Pt**
5687	**Sonoran Serif med.**	**8 CPI**	**CG Times**	**8 CPI**	**CG Times bold**	**8 CPI**		
5707	**Times Roman bold**	**12 CPI**	**CG Times bold**	**15.75CPI**	**CG Times bold**	**15.75CPI**		
5815	**Times Roman italic**	**12 CPI**	**CG Times italic**	**12 CPI**	**CG Times italic**	**12 CPI**		
5835	**Times Roman italic bold**	**10 CPI**	**CG Times bold italic**	**10 CPI**	**CG Times bold italic**	**10 CPI**		
16951	**Sonoran Serif med.**	**12 CPI**	**CG Times**	**12 CPI**				
16971	**Sonoran Ser med bold**	**12 CPI**	**CG Times bold**	**12 CPI**				
17079	**Sonoran Serif med italic**	**12 CPI**	**CG Times italic**	**12 CPI**				
17099	**Sonoran Ser med ital bold**	**12 CPI**	**CG Times italic bold**	**12 CPI**				

Appendix C: Paper Source PCL Tray Reference

Refer to the following table to determine the paper source of a particular model of printer.

Model s → Paper Source ↓	4100, 4200, 4300, 4345MFP, 9055 9065	3700	4100 MFP	4600, 4650, 5500	9000	9000MFP, 9040MFP, 9050MFP
Tray 1 – Multi-Purpose Tray	4	4	4	4	4	4
Tray 2 – 1st Cassette	1	1	1	1	1	1
Tray 3 – 2nd Cassette	5	5	5	5	5	5
Tray 4 – 3rd Cassette	8			8	20	20
Tray 5 –	9					
Envelope Feeder	6	6		6		
Manual feed, paper	2	2	2	2	2	2
Manual feed, envelope	3	3		3	3	
Auto Select	7	7	7	7	7	7